COURSE OVERVIEW IE0572
Instrumentation Diagrams & Symbols

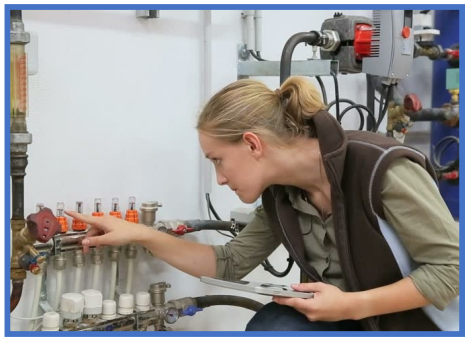
Course Title
Instrumentation Diagrams & Symbols

Course Date/Venue
Session 1: June 22-26, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: November 17-21, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
IE0572

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of ISA instrumentation diagrams and symbols. It covers the ISA symbol standards comprising of ANSI/ISA-201981, ANSI/ISA-5.51985, ANSI/ISA-5.41991, ANSI/ISA5.06.01-2007 and ANSI/ISA-5.12009; the general instrument or function symbols, instrument line symbols and function blocks-function designations; and the typical letters including typical letter combinations, filed or local instruments, more primary element symbols, typical transmitter-flow, orifice plates, typical transmitters-level and transmitters pressure and temperature.

During this interactive course, participants will learn the typical controllers; the control valve types, actuator action and power failure; the process flow diagram, process description, P&IDs standards, ISA standards and typical P&ID; the climatization; the logic diagram; the instrument installation details; and the types and uses of loop diagram.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a comprehensive knowledge on ISA instrumentation diagrams and symbols
- Discuss ISA symbol standards covering ANSI/ISA-201981, ANSI/ISA-5.51985, ANSI/ISA-5.41991, ANSI/ISA5.06.01-2007 and ANSI/ISA-5.12009
- Illustrate ISA symbols covering general instrument or function symbols, instrument line symbols and function blocks-function designations
- Explain ISA standard identification letters including typical letters including typical letter combinations, filed or local instruments, more primary element symbols, typical transmitter-flow, orifice plates, typical transmitters-level and transmitters pressure and temperature
- Recognize typical controllers covering field locations, control board locations, distributed control system (DCS), computer and programmable logic controller (PLC)
- Identify control valve types and discuss actuator action and power failure
- Discuss process flow diagram, process description, P&IDs standards, ISA standards and typical P&ID
- Recognize climatization covering instrument numbering as well as instrument list consisting of specification forms and ISA20 specification form
- Identify logic diagram covering binary logic diagrams for process operations and motor start logic
- Apply instrument installation and discuss installation details
- Recognize the types and uses of loop diagram as well as control schemes covering feedback loop, radio control and cascade control

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of instrumentation diagrams and symbols for technicians and engineers who are involved in calculation, design, selection, manufacturing, safety, quality and maintenance of systems and equipment in industrial processes.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Course Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Instructor

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Sydney Thoresson, PE, BSc, is a **Senior Electrical & Instrumentation Engineer** with over **40 years** of extensive experience within the **Petrochemical**, **Utilities**, **Oil**, **Gas** and **Power** industries. His specialization highly evolves in **Process Control Instrumentation**, **Process Instrumentation & Control**, **Process Control**, **Instrumentation**, **Troubleshooting** & Problem Solving, Process **Instrumentation** and Control Techniques, **Instrumentation** for Process Optimization and Control, Process Automation and **Instrumentation** Systems Integration, Troubleshooting in Process Control Systems**,** Process Control & Safeguarding, **Troubleshooting Instrumentation** and Control Systems, GC Processes **Troubleshooting** and Control Systems, Practical **Troubleshooting** and Repair of Electronic Circuits**,** Process Control, **Troubleshooting** & **Problem Solving.** Process Control (**PCI**) & Safeguarding, **Control Loop & Valve Tuning**, **Controller Maintenance** Procedures, High Integrity Protection Systems (**HIPS**), **Instrument Calibration & Maintenance**, **Instrumented Safety Systems**, **Compressor Control & Protection**, **Control Systems**, Programmable Logic Controllers (**PLC**), **SCADA System**, **PLC & SCADA** - Automation & Process Control, **PLC & SCADA** Systems Application, Technical **DCS/SCADA**, **PLC-SIMATIC S7 300/400**: Configuration, Programming and Troubleshooting, **PLC, Telemetry and SCADA** Technologies, Cyber Security of Industrial Control System (**PLC, DCS, SCADA & IED**), Basics of **Instrumentation Control System, DCS**, **Distributed Control System** - Operations & Techniques, Distributed Control System (**DCS**) Principles, Applications, Selection & Troubleshooting, Distributed Control Systems (**DCS**) especially in **Honeywell DCS**, **H&B DCS**, **Modicon, Siemens**, **Telemecanique**, **Wonderware** and **Adrioit,** Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), Emergency Shutdown (**ESD**), **Emergency Shutdown** System, Variable Frequency Drive (**VFD**), **Flowmetering & Custody Measurement**, **Multiphase Flowmetering**, **Measurement and Control**, **Mass Measuring System Batching** (**Philips**), Arc Furnace Automation-Ferro Alloys, Factory Automation and Quality Assurance Accreditation (**ISO 9000** and **Standard BS 5750**). Further, he is also well-versed in **Electrical Safety**, **Electrical Hazards Assessment**, **Electrical Equipment**, **Personal Protective Equipment**, Log-Out & Tag-Out (**LOTO**), **ALARP & LOPA** Methods, Confined Workspaces, Power **Quality**, Power **Network**, Power **Distribution**, **Distribution Systems**, **Power Systems Control**, **Power Systems Security**, Power **Electronics**, Electrical **Substations**, **UPS** & **Battery System**, **Earthing & Grounding**, Power **Generation**, **Protective Systems**, **Electrical Generators**, **Power** & **Distribution Transformers**, **Electrical Motors**, **Switchgears**, **Transformers**, **AC** & **DC Drives**, **Variable Speed Drives** & **Generators** and **Generator Protection**. He is currently the **Projects Manager** wherein he manages projects in the field of electrical and automation engineering and in-charge of various process hazard analysis, fault task analysis, FMEA and HAZOP study.

During Mr. Thoresson's career life, he has gained his thorough and practical experience through various challenging positions and dedication as the **Contracts & Projects Manager**, **Managing Director**, **Technical Director**, **Divisional Manager**, **Plant Automation Engineer**, **Senior Consulting Engineer**, **Senior Systems Engineer**, **Electrical & Instrumentation Engineer**, **Consulting Engineer**, **Service Engineer** and **Section Leader** from several international companies such as **Philips**, **FEDMIS**, **AEG**, **DAVY International**, **BOSCH**, **Billiton** and **Endress/Hauser**.

Mr. Thoresson is a **Registered Professional Engineering Technologist** and has a **Bachelor's** degree in **Electrical & Electronics Engineering** and a **National Diploma** in **Radio Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and an active member of the International Society of Automation (**ISA**) and the Society for Automation, Instrumentation, Measurement and Control (**SAIMC**). He has further delivered numerous trainings, courses, seminars, conferences and workshops worldwide.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***ISA Symbol Standards*** *ANSI/ISA-201981–Specification Forms for Process Measurement & Control Instruments, Primary Elements & Control Valves ● ANSI/ISA-5.51985 Graphic Symbols for Process Displays ● ANSI/ISA-5.41991–Instrument Loop Diagrams ● ANSI/ISA5.06.01-2007 – Functional Requirements Documentation for Control Software Applications ● ANSI/ISA-5.12009–Instrumentation Symbols & Identification*
0930 – 0945	*Break*
0945 – 1100	***ISA Symbols–An Overview*** *General Instrument or Function Symbols ● Instrument Line Symbols ● Function Blocks-Function Designations*
1100 - 1230	***ISA Standard Identification Letters*** *Typical Letter Combinations ● Field or Local Instruments ● More Primary Element Symbols*
1230 - 1245	*Break*
1245 - 1420	***ISA Standard Identification Letters (cont'd)*** *Typical Transmitters-Flow ● Orifice Plates*
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***ISA Standard Identification Letters (cont'd)*** *Typical Transmitters-Level ● Transmitters-Pressure & Temperature*
0930 – 0945	*Break*
0945 – 1100	***Typical Controllers*** *Field Locations ● Control Board Locations ● Distributed Control System (DCS)*
1100 - 1230	***Typical Controllers (cont'd)*** *Computer ● Programmable Logic Controller*
1230 - 1245	*Break*
1245 - 1420	***Control Valves Types*** *Actuator Action & Power Failure*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Process Flow Diagram*** *Process Description ● P&IDs Standards*
0930 – 0945	*Break*
0945 – 1100	***Process Flow Diagram (cont'd)*** *ISA Standards ● Typical P&ID*
1100 - 1230	***Case Study #1: Develop a Diagram for a Typical Feedback Loop***
1230 - 1245	*Break*
1245 - 1420	***Climatization*** *Instrument Numbering*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Instrument list*** *Specification Forms ● An ISA20 Specification Form*
0930 – 0945	*Break*
0945 – 1100	***Logic Diagram*** *Binary Logic Diagrams for Process Operations ● Motor Start Logic*
1100 - 1230	***Case Study #2: Compare Symbols of Instrument Devices with their Names***
1230 - 1245	*Prayer Break*
1245 - 1420	***Instrument Installation*** *Installation Detail*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Loop Diagram*** *Types & Uses*
0830 – 0930	***Control Schemes*** *Feedback Loop ● Radio Control ● Cascade Control*
0930 – 0945	*Break*
0945 - 1230	***Case Study #3: Use Standards Symbols to Create Partial Instrument Loops***
1230 - 1245	*Break*
1245 – 1345	***Split Range***
1345 - 1400	***Course Conclusion***
1400 - 1415	***POST-TEST***
1415 - 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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