



COURSE OVERVIEW ME0978 Howden Screw Compressor MK/WRV Operation Maintenance & Troubleshooting

Course Title

Howden Screw Compressor MK/WRV
Operation Maintenance & Troubleshooting

Course Date/Venue

Session 1: February 09-13, 2025/Boardroom
1, Elite Byblos Hotel Al Barsha,
Sheikh Zayed Road, Dubai, UAE
Session 2: August 03-07, 2025/Al Khobar
Meeting Room, Hilton Garden Inn,
Al Khobar, KSA



Course Reference

ME0978

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of screw compressors. It covers the compression cycle and the fundamental of operation of twin screw; the normal operation and shutdown procedures; the construction characteristics including API 619 compliance; the variable volume control MVI and AVI; the performance characteristics and superfeed; the compressor auxiliary equipment and functions; and the installation checks on alignment of couplings and unit troubleshooting and diagnostics.

During this interactive course participants will learn the major overhaul and dismantling procedures on a screw compressor; the detailed inspection and checking on the clearances of components and bearings; the assembly procedures, detailed measurements and setting of clearances; the pressure testing of the screw compressor, loading and unloading pressures; the efficient measurements and plotting of the operating curves; the preventive maintenance procedures on a daily, weekly and annual basis; and the efficiency and performance monitoring of screw compressors in a professional manner.



Course Objectives

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

- Apply and gain a comprehensive knowledge on screw compressors
- Discuss screw compressor covering compression cycle and the fundamental of operation of twin screw
- Employ normal operation and shutdown procedures
- Deal with emergencies during operation and describe the construction characteristics including API 619 compliance
- Recognize the variable volume control MVI and AVI
- Identify the performance characteristics and the superfeed as well as compressor auxiliary equipment and functions
- Carryout installation checks on alignment of couplings and unit troubleshooting and diagnostics
- Prepare for major overhaul, identify spare part tools and perform dismantling procedures on a screw compressor
- Employ detailed inspection and checking on the clearances of components and bearings
- Demonstrate assembly procedures, detailed measurements and setting of clearances
- Perform pressure testing of the screw compressor and setting of the loading and unloading pressures
- Carryout efficient measurements and plotting of the operating curves
- Employ preventive maintenance procedures on a daily, weekly and annual basis
- Monitor the efficiency and performance of screw compressors in a professional manner

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 screw compressors for plant and maintenance engineers, maintenance managers and supervisors and compressor specialists. It should be valuable to senior maintenance mechanics and those who are involved with compressors’ operation, maintenance, troubleshooting and overhaul.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations:-

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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.

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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.

Accommodation

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



Course Instructor(s)

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. Daniel Williams, PE, BSc, is a Senior Mechanical & Maintenance Engineer with over 35 years of reliability & maintenance experience. His expertise covers Valve Selection & Sizing, Pressure Relief Value (PRV) & Pressure Safety Valve (PSV) Design of Operation, Valves & Safety Devices Maintenance & Troubleshooting, PRV & PSV Inspection & Testing, Advanced Fluid Mechanics, Valve Actuation & Control System, Safety Protocols & Emergency Shut-off Systems, Valve Engineering Codes & Standards, Centrifugal Pumps & Troubleshooting, Reciprocating & Centrifugal Compressors, Screw Compressor, Compressor Control & Protection, Gas & Steam Turbines, Turbine Operations, Gas Turbine Technology, Valves, Process Control Valves, Bearings & Lubrication, Heat Transfer, Machine Design, Fluid Mechanics, Heating & Cooling Systems, Heat Insulation Systems, Heat Exchanger & Cooling Towers, Maintenance Planning & Scheduling, Maintenance Planning Process, Maintenance Shutdown & Turnaround, Maintenance Audit Best Practices, Maintenance & Reliability Management, Reliability Engineering, Maintenance & Reliability Best Practices, Reliability, Availability & Maintainability (RAM), Root Cause Analysis, Maintenance Process, Gearboxes, CMMS (SAP, MAXIMO, ELLIPSE), Maintenance & Reliability Management, Machinery Root Cause Failure Analysis (RCFA), Lubrication Technology, Rotating, Auxiliary & Static Equipment such as Pump, Valve, Compressor, Pipe, Piping, Turbines, Bearings, Blower, Fan and Heat Exchanger, Hydraulic Systems, Material Cataloguing & Specifications, Vibration Analysis, Preventive Maintenance and Condition Based Monitoring.

Mr. Williams worked with several international companies in **North America, South America, Europe, Australia and Asia**. He occupied significant positions such as a **Maintenance Manager, Product Manager, Senior Mechanical Projects Engineer, Mechanical Engineer, Maintenance Engineer, Maintenance Planning Superintendent, Maintenance & Reliability Superintendent, Senior Maintenance Planner, Maintenance Planner, Materials Specialist, Maintenance Improvement Process Co-Coordinator, Mechanic Operator and Instructor/Trainer.**

Mr. Williams has a **Bachelor's degree in Mechanical Engineering** from the **University of Arizona, USA**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.

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.





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 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	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Screw Compressor
0930 – 0945	<i>Break</i>
0945 – 1100	Screw Compressor Theory - The Compression Cycle <i>Fundamental of Operation of Twin Screw-First Start up</i>
1100 – 1215	Normal Operation & Shutdown Procedures
1215 – 1230	<i>Break</i>
1230 – 1420	Dealing with Emergencies during Operation
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0930	The MK/WRV Family of Screw Compressors
0930 – 0945	<i>Break</i>
0945 – 1100	Construction Characteristics & API 619 Compliance
1100 – 1215	Variable Volume Control-MVI & AVI
1215 – 1230	<i>Break</i>
1230 – 1420	Performance Characteristics & the Superfeed
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

0730 – 0930	Compressor Auxiliary Equipment & Functions
0930 – 0945	<i>Break</i>
0945 – 1100	Installation Checks-Alignment of Couplings
1100 – 1215	Unit Troubleshooting & Diagnostics
1215 – 1230	<i>Break</i>
1230 – 1420	Troubleshooting, Low Discharge Temperature & High Discharge Temperature
1420 – 1430	Recap
1430	<i>Lunch & End of Day Three</i>





Day 4

0730 – 0930	<i>Preparing for Major Overhaul-Spare Parts-Tools</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>The Dismantling Procedures on a Screw Compressor</i>
1100 – 1215	<i>Detailed Inspection & Checking the Clearances of Components & Bearings -What to Replace & Criteria for Replacement</i>
1215 – 1230	<i>Break</i>
1230 – 1420	<i>Assembly Procedures & Detailed Measurements & Setting of Clearances</i>
1420 – 1430	<i>Recap</i>
1430	<i>Lunch & End of Day Four</i>

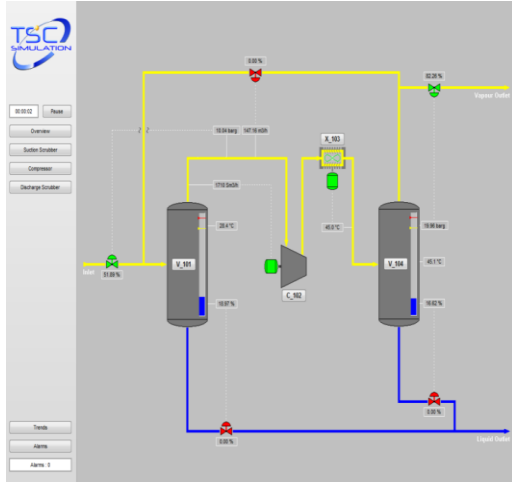
Day 5

0730 – 0930	<i>Perform Pressure Testing of the Screw Compressor & Setting of the Loading & Unloading Pressures</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<i>Efficiency Measurements & Plotting the Operating Curves</i>
1100 – 1215	<i>Preventive Maintenance Procedures Daily, Weekly Annually</i>
1215 – 1230	<i>Break</i>
1230 – 1345	<i>Monitoring Efficiency & Performance</i>
1345 – 1400	<i>Course Conclusion</i>
1400 – 1415	<i>POST-TEST</i>
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

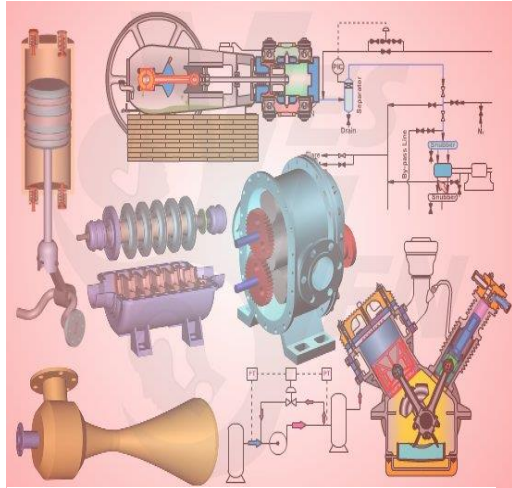


Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators “SIM 3300 Centrifugal Compressor” and “CBT on Compressors”.



SIM 3300 Centrifugal Compressor Simulator



CBT on Compressors

Course Coordinator

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