# 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: January 03-07, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar
Session 2: June 20-24, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar

## 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 Howden Screw Compressor MK/WRV Operation, Maintenance & Troubleshooting. 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/Outcomes & Benefits for the Participants

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

- Apply and gain a comprehensive knowledge on howden screw compressor MK/WRV operation, maintenance and troubleshooting
- 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 howden screw compressor MK/WRV operation, maintenance and troubleshooting 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 who completed a minimum of 80% of the total tuition hours.

## Certificate Accreditations

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

## 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 **30 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, **Pressure Vessels** Design, Advanced Fluid Mechanics, **Valve** Actuation & Control System, Safety Protocols & Emergency Shut-off Systems, **Valve** Engineering Codes & Standards, **Diesel Engine** Operations, **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$ 6,000** per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Training Methodology

Our courses employ an interactive, learner-centred methodology that integrates theoretical knowledge with practical application. The training is delivered through a suitable combination of some or all of the following methods, selected according to the course content and learning objectives:

- Instructor-led presentations and facilitated discussions
- Practical workshops and participant presentations
- Hands-on exercises and real-world case studies
- Equipment demonstrations and technical drawings
- Hardware- and software-based simulations
- Gamification & Role Play in soft-skills courses only
- Virtual Reality (VR) and Augmented Reality (AR)
- Instructional videos and other relevant training resources

This blended approach encourages active participation, strengthens practical skills and supports the effective application of acquired knowledge in the workplace.

## Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

## 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* | ***Introduction to Screw Compressor*** |
| *0930 – 0945* | *Break* |
| *0945 – 1100* | ***Screw Compressor Theory - The Compression Cycle***<br>*Fundamental of Operation of Twin Screw–First Start up* |
| *1100 – 1215* | ***Normal Operation & Shutdown Procedures*** |
| *1215 – 1230* | *Break* |
| *1230 – 1420* | ***Dealing with Emergencies during Operation*** |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day One* |

***Day 2***

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

**Day 3**

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

**Day 4**

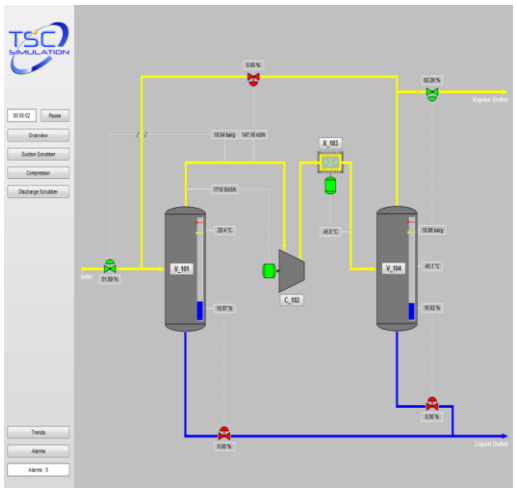
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|---|---|
| 0730 – 0930 | ***Preparing for Major Overhaul-Spare Parts-Tools*** |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***The Dismantling Procedures on a Screw Compressor*** |
| 1100 – 1215 | ***Detailed Inspection & Checking the Clearances of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

**Day 5**

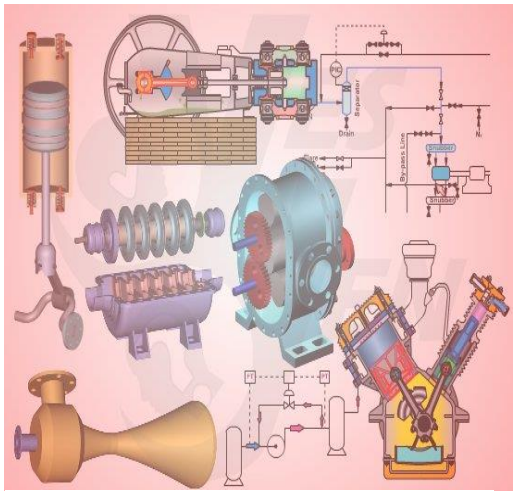
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|---|---|
| 0730 – 0930 | ***Perform Pressure Testing of the Screw Compressor & Setting of the Loading & Unloading Pressures*** |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***Efficiency Measurements & Plotting the Operating Curves*** |
| 1100 – 1215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

## 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

Jaryl Castillo, Tel: +974 6652 9196, Email: jaryl@haward.org