



## COURSE OVERVIEW ME0978-4D Howden Screw Compressor MK/WRV Operation Maintenance & Troubleshooting

### Course Title

Howden Screw Compressor MK/WRV Operation Maintenance & Troubleshooting

### Course Date/Venue

Session 1: August 05-08, 2024/Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: November 04-07, 2024/Boardroom, Warwick Hotel Doha, Doha, Qatar



### Course Reference

ME0978-4D



### Course Duration/Credits

Four days/2.4 CEUs/24 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, sample video clips of the instructor’s actual lectures & practical sessions during the course 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 who completed a minimum of 80% of the total tuition hours.

### 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 **2.4 CEUs** (Continuing Education Units) or **24 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.





### 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. Dimitry Rovas**, CEng, MSc, PMI-PMP, is a **Senior Mechanical Engineer** with extensive industrial experience in **Oil, Gas, Power** and **Utilities** industries. His expertise includes **Vibration Analysis, Vibration Monitoring, Combustion in Boiler Furnaces, Pump Technology, Pump Selection & Installation, Centrifugal Pumps & Troubleshooting, Reciprocating & Centrifugal Compressors, Compressor Control & Protection, Modern Valve Technology, Bearings & Lubrication, Advanced Machinery Dynamics, Modern Heating, Pumps & Valves Maintenance & Troubleshooting, Ventilation, Air-Conditioning (HVAC) & Refrigeration Systems, Pump & Compressors Maintenance & Troubleshooting,**

**Compressors & Turbines Troubleshooting, New Emergency Air Compressors, Boiler Maintenance & Inspection, Hydraulic System Design & Troubleshooting, Pipe Stress Analysis, Gas Conditioning & Processing, Process Plant Optimization, Effective Production Operations in the Oil & Gas Fields, Gas & Steam Turbines, Turbine Operations, Gas Turbine Technology, Gas Turbine Erection & Commissioning (GE 9FA & GE9FB Units), Large Scale Natural Gas Combined Cycle Power Plant Projects (GE Equipment), Large Scale Natural Gas Cogeneration Plant Projects (GE & Siemens Equipment), Gas Turbine Condition Monitoring & Fault Diagnosis, Control & Operations of Industrial Gas Turbines, Gas Turbine Auxiliary System, Gas & Steam Turbines, Turbine Operations, Gas Turbine Technology, Rubber Compounding, Elastomers, Thermoplastic, Industrial Rubber Products, Rubber Manufacturing Systems, Heat Transfer, Vulcanization Methods, Process Plant Shutdown & Turnaround, Maintenance Optimization & Best Practices, Maintenance Auditing & Benchmarking, Reliability Management, Rotating Equipment, Energy Conservation, Energy Loss Management in Electricity Distribution Systems, Energy Saving, Thermal Power Plant Management, Thermal Power Plant Operation & Maintenance, Heat Transfer, Machine Design, Fluid Mechanics, Heating & Cooling Systems, Heat Insulation Systems, Heat Exchanger & Cooling Towers, Mechanical Erection, Heavy Rotating Equipment, Material Unloading & Storage, Commissioning & Start-Up, Process Safety Management (PSM), HAZMAT & HAZCOM, Laboratory Information Management System (LIMS) and Laboratory Quality Management (ISO 17025). Further, he is also well-versed in MS project & AutoCAD, EPC Power Plant, Power Generation, Combined Cycle Powerplant, Leadership & Mentoring, Project Management, Strategic Planning/Analysis, Construction Management, Team Formation, Relationship Building, Communication, Reporting and Six Sigma. He is currently the **Project Manager** wherein he is managing, directing and controlling all activities and functions associated with the domestic heating/cooling facilities projects.**

During his life career, Mr. Rovas has gained his practical and field experience through his various significant positions and dedication as the **EPC Project Manager, Project Manager, GE 9FB Units Materials Manager, Field Engineer, Preventive Maintenance Engineer, Gas Turbine & Erection Engineer, Researcher, Instructor/Trainer, Telecom Consultant** and **Consultant** from various companies such as the Podaras Engineering Studies, Metka and Diadikasia, S.A., Hellenic Petroleum Oil Refinery and COSMOTE.

Mr. Rovas is a **Chartered Engineer** of the **Technical Chamber of Greece**. Further, he has **Master** degrees in **Mechanical Engineering** and **Energy Production & Management** from the **National Technical University of Athens**. Moreover, he is a **Certified Instructor/Trainer**, a **Certified Project Management Professional (PMP)**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and a **Certified Six Sigma Black Belt**. He is an active member of **Project Management Institute (PMI)**, **Technical Chamber of Greece** and **Body of Certified Energy Auditors** and has further delivered numerous trainings, seminars, courses, workshops and conferences internationally.



### 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 Fee

Abu Dhabi	<b>US\$ 4,500</b> per Delegate + VAT. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Doha	<b>US\$ 5,000</b> 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	<i>Registration &amp; Coffee</i>
0800 – 0815	<i>Welcome &amp; Introduction</i>
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Introduction to Screw Compressor</b>
0930 – 0945	<i>Break</i>
0945 – 1100	<b>Screw Compressor Theory - The Compression Cycle</b> <i>Fundamental of Operation of Twin Screw-First Start up</i>
1100 – 1215	<b>Normal Operation &amp; Shutdown Procedures</b>
1215 – 1230	<i>Break</i>
1230 – 1330	<b>Dealing with Emergencies during Operation</b>
1330 - 1420	<b>The MK/WRV Family of Screw Compressors</b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>



**Day 2**

0730 – 0930	<b>Construction Characteristics &amp; API 619 Compliance</b>
0930 – 0945	<i>Break</i>
0945 – 1100	<b>Variable Volume Control-MVI &amp; AVI</b>
1100 – 1215	<b>Performance Characteristics &amp; the Superfeed</b>
1215 – 1230	<i>Break</i>
1230 – 1330	<b>Compressor Auxiliary Equipment &amp; Functions</b>
1330 - 1420	<b>Installation Checks-Alignment of Couplings</b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Two</i>

**Day 3**

0730 – 0930	<b>Unit Troubleshooting &amp; Diagnostics</b>
0930 – 0945	<i>Break</i>
0945 – 1100	<b>Troubleshooting, Low Discharge Temperature &amp; High Discharge Temperature</b>
1100 – 1215	<b>Preparing for Major Overhaul-Spare Parts-Tools</b>
1215 – 1230	<i>Break</i>
1230 – 1330	<b>The Dismantling Procedures on a Screw Compressor</b>
1330 - 1420	<b>Detailed Inspection &amp; Checking the Clearances of Components &amp; Bearings -What to Replace &amp; Criteria for Replacement</b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Three</i>

**Day 4**

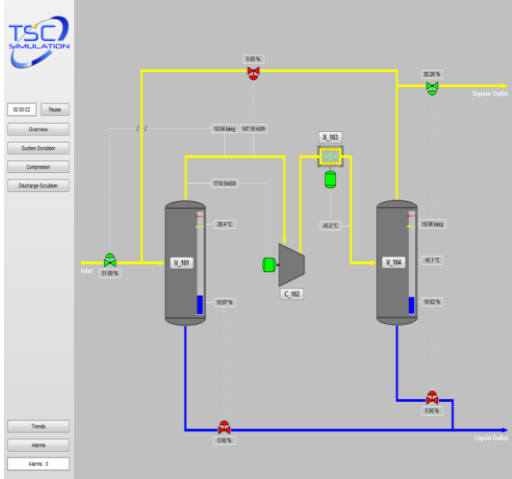
0730 - 0830	<b>Assembly Procedures &amp; Detailed Measurements &amp; Setting of Clearances</b>
0830 – 0930	<b>Perform Pressure Testing of the Screw Compressor &amp; Setting of the Loading &amp; Unloading Pressures</b>
0930 – 0945	<i>Break</i>
0945 – 1100	<b>Efficiency Measurements &amp; Plotting the Operating Curves</b>
1100 – 1215	<b>Preventive Maintenance Procedures Daily, Weekly Annually</b>
1215 – 1230	<i>Break</i>
1230 – 1345	<b>Monitoring Efficiency &amp; Performance</b>
1345 – 1400	<b>Course Conclusion</b>
1400 – 1415	<b>POST-TEST</b>
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch &amp; End of Course</i>



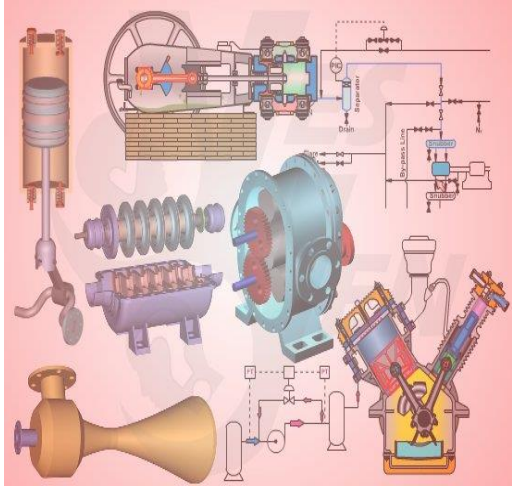


**Simulator (Hands-on Practical Sessions)**

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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