Training Registrars

**Turbomachinery/Steam Turbine/Reciprocating Compressors and Integral Gas Engine Products**

**Dresser-Rand Product Training**

Tel: (Int’l +1) 716-355-2660
Fax: (Int’l +1) 716-355-2660

**Control Systems**

**Dresser-Rand Product Training**

Tel: (Int’l +1) 713-365-2645
Fax: (Int’l +1) 713-365-2660

**Dresser-Rand do Brasil Ltda.**

Rua Lazaro Goncalves de Oliveira, 2100 - Galpao 1
Santa Barbara d’Oeste, SP 13458-626
Brazil
Tel: (Int’l +55) 19-3-728-8600
Fax: (Int’l +55) 19-3-227-8200
E-mail: oflores@dresser-rand.com

**Dresser-Rand S.A.**

Training Administrator
31, Boulevard Winston Churchill
76080 Le Havre Cedex
7013 France
Tel: (Int’l +33) 2-35-25-5296
Fax: (Int’l +33) 2-35-25-5887
E-mail: pdesmois@dresser-rand.com

**Dresser-Rand Arabia**

PO. Box 30372, Al Khobar 31952
Kingdom of Saudi Arabia
Tel: (Int’l +966) 13 851 612
Fax: (Int’l +966) 15 851 5398
Email: natalassa@dresser-rand.com

**Dresser-Rand Asia Pacific Sdn Bhd**

Unit 9-4, 9th Floor, Bangunan Malaysian Re 17 Lorong Dangun, Damansara Heights 56490 Kuala Lumpur, Malaysia
Tel: (Int’l +60) 3-2093-4633
Fax: (Int’l +60) 3-2093-2622
E-mail: trainingAP@dresser-rand.com

**Dresser-Rand AS**

Kirkegårdsbr. 45 / P.O.Box 1010
NO-3601 KONGSBERG
NORWAY
Tel: (Int’l +47) 32286107 / Mob: (Int’l +47)
92235044
Fax: (Int’l +47) 32287060
E-mail: tjohansen@dresser-rand.com

**Dresser-Rand Synchrony Business Unit**

Active Magnetic Bearings
4655 Technology Drive
Salem, VA 24553
Tel: (Int’l +1) 540-444-4200
Fax: (Int’l +1) 540-444-4201
E-mail: sales@synchrony.com

**Dresser-Rand Guascor® Engines**

Product Training
Parque Tecnológico de Alava, Leonardo Da Vinci 12,
01310 Miñano (Alava), Spain
Tel: (Int’l +34) 945 298 791
Fax: (Int’l +34) 945 298 775
E-mail: amoya@dresser-rand.com

**Note:**
Register for courses online at: www.dresser-rand.com.

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Dresser-Rand offers OEM-developed WBT courses covering operation and maintenance of reciprocating compressors, steam turbines and turbomachinery. These courses are designed for the intermediate to advanced level student and include many learning interactive activities that will enhance knowledge retention. Designed by our experienced factory training personnel and approved by in-house subject matter experts, these courses provide an excellent means to quickly train your operators and mechanics in established Dresser-Rand practices.

We have established a business relationship with DuPont Sustainable Solutions who is recognized as a global leader in flexible learning solutions and delivers the Dresser-Rand WBT courses in their award-winning DuPont eLearning Suite format. All courses will be AICC- and SCORM-certified, enabling integration with a variety of learning management systems. For more information on DuPont Sustainable Solutions and their more than 450 industrial skills training titles, visit http://www.training.dupont.com/.

open registration and client-hosted regional classes

In addition to United States-based factory, regional and machine-specific on-site training, Dresser-Rand can hold open registration courses hosted by clients in heavily equipped production areas. Courses can be hosted at a client’s site with open registration for other Dresser-Rand clients within that area. Dresser-Rand supplies all training materials such as manuals, hands-on equipment and tools. All advertising and registrations are the responsibility of Dresser-Rand.

registration, payment and cancellation policy

(visit www.dresser-rand.com for additional information)

- Dresser-Rand policy only permits us to offer training to employees of Dresser-Rand and employees of owners and operators of D-R equipment with whom we have a business relationship.
- All registrations will be confirmed upon receipt of the payment arrangements for the specific program.
- Substitutions with personnel from the same company may be made at any time with notification to the appropriate registrar.
- Class size and duration are determined by the type of school and the training location.
- Registrations cancelled by the client less than 15 days before the program are subject to one-half of the registration fee. “No shows” are subject to the entire program fee.
- D-R reserves the right to cancel or reschedule a program up to 15 days before the requested program.

payments

- All payments for U.S. programs must be in U.S. dollars.
- Purchase orders must be received by the appropriate registrar 15 days before the requested program.
- MasterCard, Visa and American Express are accepted in the U.S. only, as are company checks on the first day of class. Company checks should be made out to “Dresser-Rand Canada”.
- Prices include instruction, training manual and lunches. Asia Pacific programs include accommodations and local transportation.

Asia Pacific programs

- Purchase orders must be received by the appropriate registrar 15 days in advance of the requested program.
- Payment is required by U.S. dollar bank draft with beneficiary to “Dresser-Rand Asia Pacific Sdn Bhd” or by telegraphic transfer. Please contact the Asia Pacific Registrar for further details.
- Prices subject to change without notice. Please verify all prices with the appropriate registrar at the time of registration.

travel information

- Classes/labs are generally held from 8 am to 4 pm daily. Those traveling by air should make their reservations for departure no earlier than 5:30 p.m. on the last day of class. Please account for estimated airport travel times when making reservations.
- Reduced rate hotel accommodations are available for Painted Post and Olean schools. Participants are responsible for payment. Hotels, phone numbers and rates are available upon request.
- Airport ground transportation is available at some locations; however, rental cars are recommended for U.S.-based programs. Rental car agencies in the U.S. require the driver to have a valid U.S. or international driver license and a valid credit card.
- Check with the registrar for specific class dates, times, site information, and travel accommodations.

additional information

- Participants in classroom-based courses are required to wear business casual clothes or jeans (shorts not permitted), and leather-upper shoes (neither open-toe nor open-heel shoes are permitted – no clogs or sandals).
- Participants in hands-on labs are required to bring safety shoes, safety glasses and work clothes/coveralls (shorts not permitted).
- Gloves are provided when necessary.
- Contact your local training registrar for any questions you may have with regards to proper attire.
- All safety and security policies at each location must be followed by all students.

Asia Pacific promotions:

(supplied to AP locations)

- 5% discount for early registration (one month before the start of class).
- 5% discount for a minimum of three-person enrollment from same company.
- Prices subject to change without notice.
**Chronological Complete Schedule**

### January 2015
- Jan 12 - 16: CCS - 105 Houston, TX, USA
- Jan 19 - 23: CCL - 215 Houston, TX, USA
- Jan 14 - 15: GT - 102 Kongsvig, Norway

### February 2015
- Feb 2 - 5: Recip. Comp O&M Clagon, Indonesia
- Feb 8 - 12: CC - THEO - ME Abu Dhabi, UAE
- Feb 10 - 13: MHOS/S - 104 Houston, TX, USA
- Feb 15 - 19: CC - PRAC - ME Abu Dhabi, UAE
- Feb 17 - 20: RCS/L - 225 Edmonton, Canada
- Feb 18 - 21: ETL - 215 Houston, TX, USA
- Feb 23 - 26: EL - 215 Houston, TX, USA
- Feb 23 - 27: CDL - 215 Houston, TX, USA

### March 2015
- Mar 2 - 5: STC - 224 Sarnia, Canada
- Mar 3 - 6: RC - THEO LeHavre, France
- Mar 9 - 12: Centr. Comp O&M Kuala Lumpur, Malaysia
- Mar 9 - 13: WAS - 245 Houston, TX, USA
- Mar 10 - 13: CC - THEO LeHavre, France
- Mar 10 - 13: RCS - 105 Santa Barbara D’Oeste, Brazil
- Mar 16 - 19: CC - PRAC LeHavre, France
- Mar 17 - 20: RCS - 105 Houston, TX, USA
- Mar 23 - 26: RCL - 215 Houston, TX, USA
- Mar 24 - 27: ST - THEO LeHavre, France

### April 2015
- Apr 7 - 10: CCS - 105 Santa Barbara D’Oeste, Brazil
- Apr 12 - 16: CC - THEO - ME Al Khobar, Saudi Arabia
- Apr 13 - 17: ECT - 105 Olean, NY, USA
- Apr 13 - 17: CCS - 105 Olean, NY, USA
- Apr 14 - 17: RCS - 105 Baton Rouge, LA, USA
- Apr 19 - 23: CC - PRAC - ME Al Khobar, Saudi Arabia
- Apr 20 - 24: RCL - 215 Baton Rouge, LA, USA
- Apr 20 - 24: CCS - 105 Olean, NY, USA
- Apr 27 - 30: Recip. Comp O&M Kuala Lumpur, Malaysia

### May 2015
- May 11 - 14: Centr. Comp O&M Kuala Lumpur, Malaysia
- May 12 - 14: GT - 103 Santa Barbara D’Oeste, Brazil
- May 12 - 15: MHOS/S - 104 Houston, TX, USA
- May 18 - 22: RCS/L - 225 Houston, TX, USA
- May 20 - 21: GT - 102 Kongsvig, Norway

### June 2015
- Jun 8 - 11: STC - 224 Olean, NY, USA
- Jun 8 - 11: CC O&M & DDS-102 Clagon, Indonesia
- Jun 12 - 15: RCS - 105 Painted Post, NY, USA
- Jun 14 - 18: RC - THEO - ME Al Khobar, Saudi Arabia
- Jun 15 - 18: RCL - 215 Painted Post, NY, USA
- Jun 15 - 18: RCS - 105 Macal, Brazil

### July 2015
- Jul 6 - 10: Centr. Comp O&M Shanghai, China
- Jul 13 - 17: CCL - 215 Houston, TX, USA
- Jul 20 - 24: RCS/L - 225 Los Angeles, CA, USA
- Jul 27 - 31: ECT - 105 Los Angeles, CA, USA

### August 2015
- Aug 3 - 7: CCS - 105 Olean, NY, USA
- Aug 4 - 7: MHOS/S - 104 Houston, TX, USA
- Aug 10 - 14: CCL - 215 Olean, NY, USA
- Aug 11 - 14: WAS - 245 Houston, TX, USA
- Aug 17 - 20: STC - 224 Horgen, PA, USA
- Aug 17 - 21: RCS/L - 225 Los Angeles, CA, USA
- Aug 24 - 27: Centr Comp Hands-on Clagon, Indonesia

### September 2015
- Sep 3 - 7: Recip. Comp O&M Kuala Lumpur, Malaysia
- Sep 9 - 11: RC - THEO LeHavre, France
- Sep 14 - 18: MST - 315 Olean, NY, USA
- Sep 15 - 18: CC - THEO LeHavre, France
- Sep 15 - 18: RCS - 105 Houston, TX, USA
- Sep 15 - 18: RCS - 105 Macal, Brazil
- Sep 21 - 24: CC - THEO LeHavre, France
- Sep 21 - 24: RCL - 215 Kongsvig, Norway
- Sep 28 - Oct 1: STC - 224 Olean, NY, USA
- Sep 28 - Oct 2: ECT - 105 Houston, TX, USA
- Sep 29 - Oct 2: ST - THEO LeHavre, France

### October 2015
- Oct 5 - 8: Centr Comp O&M Kuala Lumpur, Malaysia
- Oct 5 - 9: CCS - 105 Olean, NY, USA
- Oct 8 - 12: CC - THEO - ME Abu Dhabi, UAE
- Oct 12 - 16: RCS - 105 Painted Post, NY, USA
- Oct 12 - 16: CCL - 215 Olean, NY, USA
- Oct 19 - 22: RCS/L - 225 Houston, TX, USA
- Oct 20 - 23: CCS - 105 Macal, Brazil
- Oct 26 - 30: MST - 315 Olean, NY, USA

### November 2015
- Nov 3 - 4: DGS - 102 Olean, NY, USA
- Nov 3 - 6: MHOS/S - 104 Houston, TX, USA
- Nov 10 - 12: GT - 103 Macal, Brazil
- Nov 11 - 13: IET - 103 Houston, TX, USA
- Nov 15 - 18: ST - THEO - ME Al Khobar, Saudi Arabia
- Nov 16 - 19: Steam Turbine O&M (ST - THEO)
- Nov 16 - 19: IEL - 215 Houston, TX, USA

### December 2015
- Dec 7 - 11: RCS/L - 225 Houston, TX, USA
- Dec 8 - 12: GT - 103 Kongsvig, Norway
- Dec 14 - 18: CCL - 215 Houston, TX, USA

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### Instructor-led training

**Multi-day courses**

**Steam Turbine Operation & Maintenance (STC-224)**

This four-day course is intended for operators, mechanics, supervisors, and process engineers with emphasis on the practical aspects of machinery operation and maintenance. It is designed for the following groups: operators, supervisors, and mechanical engineers. Topics cover: steam turbine fundamentals, components and functions, applications, equipment variations; steam turbine control systems; detailed operation and maintenance procedures; safety practices; disassembly, inspection, evaluation, and reassembly sequence. Price: See schedule (below)

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**Steam Turbine Operation & Maintenance (STC-224)**

This four-day course is intended for operators, mechanics, supervisors, and process engineers with an emphasis on the practical aspects of machinery operation and maintenance. Topics include: steam turbine fundamentals, components and functions; applications; equipment variations; steam turbine control systems; detailed operation; maintenance procedures; safety practices; disassembly, inspection, evaluation; and reassembly sequence. Price: $2,950 USD

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**Multi-stage Steam Turbine Class/Hands-on (MST-315)**

This five-day course is intended for operators, mechanics, supervisors, and process and mechanical engineers with emphasis on the practical aspects of multi-stage machinery operation and maintenance. Two days are devoted to classroom presentations that include steam turbine fundamentals, detailed operation and maintenance procedures (disassembly, component evaluation and reassembly) and disassembly process review. The last three days are dedicated to a hands-on lab workshop with two roundtable discussion sessions. Participants are required to inspect and disassemble a valve rack and governor linkage; remove bearings, rotor, diaphragms, labyrinth glands and springs, etc. and install bearings and diaphragms using an alignment mandrel. Valve load will be checked and adjusted.

**Price: $2,755 USD**

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**Steam Turbine Operation & Maintenance (ST - THEO)**

This four-day course emphasizes the practical aspects of machinery operation and maintenance. It is designed for the following groups: operators, supervisors, and mechanical engineers. Topics cover: steam turbine fundamentals, components and functions; applications; equipment variations; steam turbine control systems; detailed operation and maintenance procedures; safety practices; disassembly, inspection, evaluation, and reassembly sequence. Price: See schedule (below)

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**Multi-stage Steam Turbine Class/Hands-on (MST-315)**

This four-day course emphasizes the practical aspects of machinery operation and maintenance. It is designed for the following groups: operators, supervisors, and mechanical engineers. Topics cover: steam turbine fundamentals, components and functions; applications; equipment variations; steam turbine control systems; detailed operation; maintenance procedures; safety practices; disassembly, inspection, evaluation; and reassembly sequence. Price: $2,850 (ME)

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**Four-day steam turbine courses -- Asia Pacific**

This four-day course emphasizes the practical aspects of machinery operation and maintenance. It is designed for the following groups: operators, supervisors, and mechanical engineers. Topics cover: steam turbine fundamentals, components and functions; applications; equipment variations; steam turbine control systems; detailed operation and maintenance procedures; safety practices; disassembly, inspection, evaluation, and reassembly sequence. Price: See schedule (below)

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**Steam Turbine Operation & Maintenance (STC-224)**

This four-day course is intended for operators, mechanics, supervisors, and process engineers with an emphasis on the practical aspects of machinery operation and maintenance. It is designed for the following groups: operators, supervisors, and mechanical engineers. Topics cover: steam turbine fundamentals, components and functions; applications; equipment variations; steam turbine control systems; detailed operation and maintenance procedures; safety practices; disassembly, inspection, evaluation, and reassembly sequence. Price: $2,950 USD

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**Steam Turbine Operation & Maintenance (STC-224)**

This four-day course is intended for operators, mechanics, supervisors, and process engineers with an emphasis on the practical aspects of machinery operation and maintenance. Topics include: steam turbine fundamentals, components and functions; applications; equipment variations; steam turbine control systems; detailed operation; maintenance procedures; safety practices; disassembly, inspection, evaluation; and reassembly sequence. Price: $2,850 (ME)
Instructor-led training
Four-day to one week courses

Reciprocating Compressor School (RCS-105)
This classroom-based program for process reciprocating compressor personnel covers a wide range of maintenance and operational concerns related to frame components of all Dresser-Rand process compressors (previous Ingersoll-Rand – HHE/ESH/EH, and previous Worthington – BDC). Topics include: journal bearings; compressor cylinders; pistons, rods, and rings; packing/oil wiper rings; compressor valves; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

This three-day course covers gas engine components. The course focuses on the proper use of tools and measuring instruments for hands-on activities where the student will have the opportunity to reinforce knowledge learned during the lecture portion of the program. Each student must exhibit competence in a variety of knowledge, skill and performance areas. Each student is afforded the opportunity to work on the following equipment: two-throw HHE-style frame and running gear; cylinders (split and solid rider bands); a variety of valve rebuilding/evaluation workstations; several capacity control devices (plug, port and clearance pocket unloaders); piston rods and rings; piston rod run-out and rod drop indicator; high-pressure water/coolant utilizers; and a full-size test rig set up to simulate an operating cylinder. Throughout the week, students will be exposed to a variety of tools and measuring devices that include: torque wrenches, micrometers, web deflection indicators, bolt-stretch micrometers, and piston rod run-out indicators.

Price: $2,850 USD

Reciprocating Compressor Lab (RCL-215)
This hands-on program requires the students to disassemble, evaluate, repair, and reassemble many gas engine components specific to the power end. Both two-stroke cycle (TCV/TLA/HBA) and four-stroke cycle (AVU/KVTS) engine components are incorporated into the program. The program gives the opportunity to perform the following tasks: Ingersoll-Rand two-piece and Clark three-piece piston assembly; main bearing assembly; bearing crush; piston rod and rod rings; liner bore measurement and evaluation; piston ring clearance measurements; valve train; oil pump; operation measurements; shimable connecting rod bearing assembly; and valve train inspection measurements. A six-size training model is used for the students to learn proper maintenance techniques. Several classroom sessions are included to reinforce the concepts and procedures practiced in the hands-on sessions.

Price: $2,775 USD

Integral Engine Theory (IET-103)
(formerly IE-103)
This three-day school covers gas engine cycle and combustion theory and hands-on lab experience with a wide range of important operational and maintenance topics specific to D-R two-throw (formerly Dresser-Clark) and four-throw (formerly Ingersoll-Rand) integral gas engines. This program is focused on the power end and includes the following topics: two-and four-stroke assembly and maintenance of gas cylinders, power pistons, valves, connecting rod bolts; valve train and rod run-out; lubrication and cooling systems; fuels and system balancing; camshaft timing; journal bearings and running gear; crankshaft web deflections; valve train systems; and general engine maintenance and troubleshooting.

This one-week program covers a wide range of gas engine maintenance and operational concerns related to frame components of all D-R process compressors (previous Ingersoll-Rand – HHE/ESH/EH, and previous Worthington – BDC). Topics include: journal bearings; compressor cylinders; pistons, rods and rings; packing/oil wiper rings; compressor valves; capacity control devices; lubrication and cooling systems; and general engine theory; valve failure analysis; and general compressor maintenance and troubleshooting. The information presented may be applied to a variety of manufacturers' machines. Topics covered include: reciprocating compressor theory; framing and running gear; cylinders; pistons and packing rings; valves; packing; oil systems; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor cylinder theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

Price: $2,450

Reciprocating Compressor Operation & Maintenance (RC-TIEO)
This five-day classroom program covers general maintenance and operational concerns related to all D-R process compressors. Topics include: journal bearings; compressor cylinders; pistons, rods and rings; packing/oil wiper rings; compressor valves; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor cylinder theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

Price: $2,890 (ME)

Reciprocating Compressor School/Maintenance (RC-205)
This four-day program covers a wide range of gas engine maintenance and operational concerns related to frame components of all D-R process compressors (previous Ingersoll-Rand – HHE/ESH/EH, and previous Worthington – BDC). Topics include: journal bearings; compressor cylinders; pistons, rods and rings; packing/oil wiper rings; compressor valves; capacity control devices; lubrication and cooling systems; and general engine theory; valve failure analysis; and general compressor maintenance and troubleshooting. The information presented may be applied to a variety of manufacturers' machines. Topics covered include: reciprocating compressor theory; framing and running gear; cylinders; pistons and packing rings; valves; packing; oil systems; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor cylinder theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

This one-week course is designed for those who have already completed the RCS-105 course. This course will expand upon the advanced gas engine maintenance and troubleshooting skills learned during the RCS-105 course, as well as the principles of advanced valve train maintenance and troubleshooting. The course will focus on the repair, testing, and maintenance of valves, as well as advanced troubleshooting techniques. Students will gain hands-on experience with various valve types and learn how to properly test and troubleshoot them. The course will also cover the latest technology and trends in valve maintenance and troubleshooting.

Price: $2,775 USD

Reciprocating Compressor School/ Lab Combo (RCS/L-225)
This one-week program covers a wide range of gas engine maintenance and operational concerns related to frame components of all D-R process compressors (previous Ingersoll-Rand – HHE/ESH/EH, and previous Worthington – BDC). Topics include: journal bearings; compressor cylinders; pistons, rods and rings; packing/oil wiper rings; compressor valves; capacity control devices; lubrication and cooling systems; and general engine theory; valve failure analysis; and general compressor maintenance and troubleshooting. The information presented may be applied to a variety of manufacturers' machines. Topics covered include: reciprocating compressor theory; framing and running gear; cylinders; pistons and packing rings; valves; packing; oil systems; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor cylinder theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

Price: $2,775 USD

Reciprocating Compressor Operation & Maintenance (RC-TIEO)
This course (although based on the D-R product range) is generic in subject matter. The information presented may be applied to a variety of manufacturers’ machines. Topics covered include: reciprocating compressor theory; friction; framing and running gear; cylinders; pistons and packing rings; valves; packing; oil systems; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor cylinder theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

Price: $2,890 (ME)

Reciprocating Compressor School & Lab (MHOS/S-104)
This one-week classroom and hands-on program covers a wide range of gas engine and compressor maintenance and troubleshooting. Several classroom sessions are included to reinforce the knowledge and skill learned during the lecture portion of the program. Each student must exhibit competence in a variety of knowledge, skill and performance areas. Each student is afforded the opportunity to work on the following equipment: two-throw HHE-style frame and running gear; cylinders (split and solid rider bands); a variety of valve rebuilding/evaluation workstations; several capacity control devices (plug, port and clearance pocket unloaders); piston rods and rings; piston rod run-out and rod drop indicator; high-pressure water/coolant utilizers; and a full-size test rig set up to simulate an operating cylinder. Throughout the week, students will be exposed to a variety of tools and measuring devices that include: torque wrenches, micrometers, web deflection indicators, bolt-stretch micrometers, and piston rod run-out indicators.

Price: $2,775 USD

Reciprocating Compressor School & Maintenance (MHOS/S-104)
This one-week program covers a wide range of gas engine maintenance and operational concerns related to frame components of all D-R process compressors (previous Ingersoll-Rand – HHE/ESH/EH, and previous Worthington – BDC). Topics include: journal bearings; compressor cylinders; pistons, rods and rings; packing/oil wiper rings; compressor valves; capacity control devices; lubrication and cooling systems; and general engine theory; valve failure analysis; and general compressor maintenance and troubleshooting. The information presented may be applied to a variety of manufacturers' machines. Topics covered include: reciprocating compressor theory; framing and running gear; cylinders; pistons and packing rings; valves; packing; oil systems; capacity control devices; and lubrication and cooling systems. Also included are discussions on compressor cylinder theory, valve failure analysis, compressor installation, and general compressor maintenance and troubleshooting.

Price: $2,890 (ME)

Al Khobar, Saudi Arabia
Jun 14 - 18 Recip. Compressor O&M (RC - TIEO - ME)
Sep 16 - 19 Recip. Compressor O&M (RC - TIEO - ME)
Dec 7 - 11 Recip. Compressor School/Lab Combo (RCL/L – 225)

Kuala Lumpur, Malaysia
Apr 27 - 30 Recip. Compressor School/Lab Combo (RCL/L – 225)

Ciregon, Germany
Mar 3 - 6 Recip. Compressor School/Lab Combo (RCL/L – 225)

Los Angeles, California, USA
Mar 9 - 13 Wire Alignment School (WAS – 245)
Feb 23 - 26 Recip. Compressor Lab (RCL – 215)
Mar 17 - 20 Recip. Compressor School (RCS – 105)
Mar 23 - 26 Recip. Compressor Lab (RCL – 215)

Macéé, Brazil
Jan 15 - 18 Recip. Compressor School/Lab Combo (RCL/L – 225)
Jan 21 - 25 Recip. Compressor School (RCS – 105)

Painted Post, New York, USA
Jun 8 - 12 Recip. Compressor School (RCS – 105)
Jun 15 - 19 Recip. Compressor School/Lab Combo (RCL/L – 225)

Santa Barbara D'Oeste, Brazil
Mar 10 - 14 Recip. Compressor School/Lab Combo (RCL/L – 225)

2020 Reciprocating Compressor Operators & Technicians Handbook

For more information on training and education opportunities, please visit Dresser-Rand’s training and certification website.

To arrange short courses for your group, contact one of the training registrars listed on the back of this catalog.

See page 5 for Asia Pacific pricing.

# All Brazil courses: *See registrar, payment and travel* page for Asia Pacific promotions.
Centrifugal Compressor Operation & Maintenance (CCS-105)
This five-day, intermediate-level, classroom-style course introduces students to centrifugal compressor fundamentals and principles of operation. The students will review the various models of centrifugal compressors manufactured by Clark, Dresser, Dresser-Clark, Dresser-Rand, Ingersoll-Rand, and Worthington. It provides in-depth coverage of all existing support systems such as bearings, couplings, lube oil, seal oil, and dry gas seal systems, as well as the instrumentation systems required to keep these units in operation. Students will learn the correct procedures to operate and maintain the performance of a centrifugal compressor.

Price: $1,170 USD

Turbo courses (Asia Pacific)
Four-day courses
Centrifugal Compressor Operation & Maintenance and Dry Gas Seal Installation (CDL-215)
This five-day, primarily hands-on based course begins with short lectures that not only recap centrifugal compressor fundamentals and principles of operation, but also compare the features and benefits of the DATUM line of compressors to conventional designs. The interactive hands-on portion of the course requires the students to participate in the removal of the internal bundle from the compressor case of a radially split DATUM compressor. During this exercise, students will learn how to use all of the special tooling required to perform these maintenance techniques which includes working with hydraulic- and polygon-fit components. Students will employ all the normal measuring instruments to position the rotor and evaluate the condition of the compressor’s internal components.

The course will conclude with a comprehensive, multiple-choice exam that challenges the student to recall the information learned during the course.

Price: $2,755 USD

Gas Turbines (GT-102) (Kongsberg)
This four-day course introduces students to the fundamentals of gas turbine operation. Students will review all of the basic aerodynamics, compressor surge, lubricating and sealing systems, dry gas seals, mechanical build, and operation.

Price: $2,450 (Europe)

Centrifugal Compressor Operation & Maintenance (CCS-105) (Brazil)
This five-day, intermediate-level, classroom-style course introduces students to centrifugal compressor fundamentals and principles of operation. The students will review all of the basic aerodynamics, compressor surge, lubricating and sealing systems, dry gas seals, mechanical build, and operation.

Price: $2,850 (ME)

Drum](#) gas seal systems, as well as the instrumentation systems required to keep these units in operation. Students will learn the correct procedures to operate and maintain the performance of a centrifugal compressor.

Centrifugal Compressor Operation & Maintenance (CCS-105)
Centrifugal Compressor Hands-on (CC-PRAC)
This five-day course is based on a vertically split 45LB-line compressor. A recap of compressor components, and review of relevant drawings, pre-strip and assembly procedures is followed by compressor dismantling and rebuilding. Students will learn how to use all of the special tooling required to perform the maintenance techniques when working with hydraulic fit components, as well as how to use all the normal measuring instruments to assess the condition of a compressor’s internal components.

Price: $3,225 (ME)

Centrifugal Compressor Operation & Maintenance (CCS-105)
This five-day, intermediate-level, classroom-style course introduces students to centrifugal compressor fundamentals and principles of operation. The students will review all of the basic aerodynamics, compressor surge, lubricating and sealing systems, dry gas seals, mechanical build, and operation.

Price: $2950 (ME)

Centrifugal Compressor Hands-on (CC-PRAC)
This five-day course is based on a vertically split 45LB-line compressor. A recap of compressor components, and review of relevant drawings, pre-strip and assembly procedures is followed by compressor dismantling and rebuilding. Students will learn how to use all of the special tooling required to perform the maintenance techniques when working with hydraulic fit components, as well as how to use all the normal measuring instruments to assess the condition of a compressor’s internal components.

Price: $3,225 (ME)

Centrifugal Compressor Operation & Maintenance (CCS-105)
This five-day, intermediate-level, classroom-style course introduces students to centrifugal compressor fundamentals and principles of operation. The students will review all of the basic aerodynamics, compressor surge, lubricating and sealing systems, dry gas seals, mechanical build, and operation.

Price: $2,450 (Europe)

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Price: $2,450 (Europe)
Frame Lubrication System (RWB006)
Level: Intermediate
Focus: Maintenance
This intermediate-level course describes the components of the frame lubrication system, including how to properly measure the procedures used to properly disassemble and reassemble the packing case within the compressor and on a workbench. The course instructions explain the correct procedure for safely removing a packing case. The critical inspection points for the components will be identified and used to determine the condition of the packing. The course will conclude with a listing on the packing case lubrication and cooling.

Piston Rod Ring Assembly (RWB010)
Level: Intermediate
Focus: Maintenance
This intermediate-level course is designed for maintenance technicians who understand the meaning and effects of piston rod runout on the operation of reciprocating compressors. The course also teaches how to measure bearing runout, identify the factors that influence runout, and correct an out-of-specification runout condition. The course contains guidelines for helping the students interpret the runout readings and provides a calculation to aid them in shimming a crosshead to a correct runout that is out of tolerance.

Bolt Torque (RWB011)
Focus: Maintenance
This comprehensive maintenance-oriented course provides the student an opportunity to learn the characteristics of threaded bolts used in reciprocating compressors, how certain variables such as lubrication, wrench extensions, damaged threads, tool calibration, and self-locking fasteners affect the fasteners. Although many types of torqueing tools will be discussed, the proper use of the clicker-type torque wrench is emphasized throughout the program.

Reciprocating Crankshaft Web Deflection (RWB007)
Level: Intermediate
Focus: Maintenance
This intermediate-level course describes the components of the crankshaft and how they interact with each other when the engine is in operation. The course also teaches how to properly measure the procedures used to properly disassemble and reassemble the packing case within the compressor and on a workbench. The course instructions explain the correct procedure for safely removing a packing case. The critical inspection points for the components will be identified and used to determine the condition of the packing. The course will conclude with a listing on the packing case lubrication and cooling.

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Surge and Surge Control (TWB002)

Level: Intermediate  Focus: Operations/Maintenance

This intermediate-level, operator-oriented course discusses the surge phenomena that can occur when operating a centrifugal compressor. It describes the warning signs of surge, the consequences of surge and the strategies and benefits of controlling it. The course also identifies the components of a typical performance curve and their relationship to the operation of a centrifugal compressor. A variety of interactive activities and periodic review questions challenge students to recognize the characteristics of surge and how to avoid it during normal operation.

Steam Turbine Fundamentals & Major Components (SWB001)

Level: Intermediate  Focus: Operations/Maintenance

This course describes steam turbine fundamentals associated with impulse- and reaction-type turbines, and explains the major components associated with a steam turbine, including turbine cases, internal steam path components, safety devices, bearings, seals, and valves.

Steam Turbine Operation (SWB002)

Level: Intermediate  Focus: Operations

This intermediate-level course is designed to offer the student an understanding of how to start, load and stop a steam turbine. Lesson topics include preparations for starting, starting and warm-up, overspeed testing, normal operation and loading, and unloading and stopping. Each lesson is designed with interactive activities and review questions to reinforce learning concepts.

Steam Turbine Overspeed Trip Settings (SWB003)

Level: Intermediate  Focus: Maintenance

This intermediate-level course describes the components that make up mechanical and electrical overspeed trip systems for steam turbines. Detailed lessons, interactive activities and periodic review questions can help students understand the purpose of overspeed systems, as well as what adjustments and testing are required for the systems.

Dresser-Rand Guascor® Engines

Four-day Guascor gas engines training course

Gas Engines Operation & Maintenance

This four-day course emphasizes the practical aspects of internal combustion engine and maintenance. One day of classroom training covers detailed operation, safety practices, disassembly, inspection, and evaluation. Three days of hands-on training cover maintenance sequence for operation types E1, E2 and E3.

Gas Engines Major Overhaul

This four-day course is intended for operators, mechanics, supervisors, and process and mechanical engineers with an emphasis on the practical aspects of machinery operation and maintenance. Four days of hands-on training cover maintenance sequence for operation types R1, R2 and R3.

Synchrony® Active Magnetic Bearings

Introduction to Synchrony Active Magnetic Bearings & Rotordynamics

This two-day course is an introduction to active magnetic bearings and provides a detailed overview of a typical magnetic bearing system and the theoretical and practical aspects of rotodynamic analysis. This course is recommended for design engineers.

• Day 1: Introduction to magnetic bearings and Applicable Industry Standards
• Day 2: Introduction and hands-on – user interface and rotodynamic software

Synchrony Magnetic Bearings Installation & Operation and Magnetic Bearing Optimization

This three-day course is recommended for operations and services professionals. It includes three days of hands-on training covering shimming and assembly sequences, system operation and use of the “Synchrony Toolbox” user interface to perform level II and level III troubleshooting.

• Day 1: Installation of mechanical components
• Day 2: Operation, tools and parameters – introduction to Synchrony user interface
• Day 3: Optimization and troubleshooting
Reciprocating compressors & integral gas engines schedule

**Al Khobar, Saudi Arabia**
- June 14-18: Recip. Compressor O&M (RC - THEO - ME)
- Feb 25: Recip. Compressor Operation & Maintenance
- Oct 17-20: Centrifugal Compressor Operation & Maintenance

**Baton Rouge, Louisiana, USA**
- Apr 14-17: Recip. Compressor School (RCS - 105)
- Apr 20-21: Recip. Compressor Lab (RCL - 215)

**Cilegon, Indonesia**
- Feb 2-5: Recip. Compressor Operation & Maintenance

**Houston, Texas, USA**
- Feb 10-11: MOS, HOS, HOSS Recip. School and Lab (MHOS/L - 104)
- Feb 23-26: Integral Engine Lab (IEL - 215)
- Mar 9-11: Wire Alignment School (WAS - 245)
- Mar 16-20: Recip. Compressor School (RCS - 105)
- Mar 23-26: Recip. Compressor Lab (RCL - 215)
- Apr 13-17: Integral Engine/Compressor Theory (ICT - 105)
- May 12-16: MOS, HOS, HOSS Recip. School and Lab (MHOS/L - 104)
- May 19-22: Recip. Compressor School/Lab Combo (RCS/L - 225)
- Jul 20-24: Recip. Compressor School/Lab Combo (RCS/L - 225)
- Aug 4-7: MOS, HOS, HOSS Recip. School and Lab (MHOS/L - 104)
- Aug 10-14: Wire Alignment School (WAS - 245)
- Sep 15-18: Recip. Compressor School (RCS - 105)
- Sep 21-24: Recip. Compressor Lab (RCL - 215)
- Sep 28-Oct 2: Integral Engine/Compressor Theory (ICT - 105)
- Nov 3-6: MOS, HOS, HOSS Recip. School and Lab (MHOS/L - 104)
- Nov 11-13: Integral Engine Theory (MET - 103)

**Los Angeles, California, USA**
- July 27-31: Integral Engine/Compressor Theory (ICT - 105)
- Aug 17-21: Recip. Compressor School/Lab Combo (RCS/L - 225)

**Macaé, Brazil**
- June 15-18: Recip. Compressor School (RCS - 105)
- Sept 15-18: Recip. Compressor School (RCS - 105)

**Painted Post, New York, USA**
- Jun 8-12: Recip. Compressor School (RCS - 105)
- Jun 15-18: Recip. Compressor Lab (RCL - 215)
- Jun 23-25: Integral Engine Theory (MET - 103)
- Oct 12-16: Recip. Compressor School (RCS - 105)

**Santa Barbara, D’Oeste, Brazil**
- Mar 10-13: Recip. Compressor School (RCS - 105)

**Steam turbine schedule**

**Al Khobar, Saudi Arabia**
- Nov 15-18: Steam Turbine O&M (ST - THEO - ME)

**Edmonton, Alberta, Canada**
- Feb 17-20: Steam Turbine O&M (STC - 224)

**Horsham, Pennsylvania, USA**
- Aug 17-20: Steam Turbine O&M (STC - 224)

**Kuala Lumpur, Malaysia**
- Nov 16-19: Steam Turbine O&M (STC - 224)

**Los Angeles, California, USA**
- July 20-27: Steam Turbine O&M (STC - 224)

Turbomachinery schedule

**Abu Dhabi, UAE**
- Feb 8-12: Centrif. Comp. Operation & Maintenance (CC - THEO - ME)
- Feb 15-19: Centrif. Comp. Hands-on (CC - PRAC - ME)

**Al Khobar, Saudi Arabia**
- Apr 12-16: Centrif. Comp. Operation & Maintenance (CC - THEO - ME)
- Apr 19-23: Centrif. Comp. Operation & Maintenance (CC - THEO - ME)

**Santa Barbara, D’Oeste, Brazil**
- Apr 7-10: Centrif. Comp. Operation & Maintenance (CCS - 105)

**Baton Rouge, Louisiana, USA**

**Hong Kong, China**
- Aug 13-17: Gas Turbines (GT - 102)

**Kuala Lumpur, Malaysia**
- May 9-12: Centrif. Comp. Operation & Maintenance
- May 11-14: Centrif. Comp. Operation & Maintenance

**Le Havre, France**
- Mar 16-19: Centrif. Comp. Hands-on (CC - PRAC)
- Sept 21-24: Centrif. Comp. Hands-on (CC - PRAC)

**Olean, New York, USA**
- Apr 13-17: Centrif. Comp. Operation & Maintenance (CCS - 105)
- June 16-17: Dry Gas Seal Installation (DGS - 102)
- Aug 3-7: Centrif. Comp. Operation & Maintenance (CCS - 105)
- Aug 10-14: Centrif. Comp. Hands-on Lab (CCL - 215)
- Oct 5-9: Centrif. Comp. Operation & Maintenance (CCS - 105)
- Nov 3-4: Dry Gas Seal Installation (DGS - 102)

**Shanghai, China**
- July 6-10: Centrif. Comp. Operation & Maintenance and Dry Gas Seal Installation