

# COMPRESSOR TECHNOLOGY TRAINING

## TRAINING INFORMATION FOR LABY®

*Training Location: Winterthur, Switzerland*

**Training is essential for the safe operation and maintenance of compressors. In order to minimize downtime and maximize profit, these complicated machines need the attention of competent, professionally trained people.**

Here at Burckhardt's Education Campus, we provide training with specialized trainers and unique programs that consist of theoretical and hands-on courses. We offer a large modern training center in Winterthur with full size compressors that prepare your staff for the real experience. We believe classroom sessions combined with the **hands-on** training experience is the key to fully understanding the function of a compressor.

Burckhardt Compressor Technology Training prepares your staff in every aspect of compressor handling; Compression theory, preventive maintenance, reliable operation, maximizing mechanical availability and maintenance planning are just some of the key topics covered that will enhance your compressors life cycle.



### Options for operation and maintenance training

- 3 days (theory & hands on)
- 5 days (theory & hands on)
- Optional + 2 days of Prognost training. Theory & computer hands on. Min. 5 participants

|                             |          |  |
|-----------------------------|----------|--|
| <b>Target Group</b>         |          | <ul style="list-style-type: none"> <li>• Maintenance supervisors</li> <li>• Superintendents</li> <li>• Operator and maintenance personnel</li> <li>• Service engineers, chief engineers, cargo engineers</li> <li>• Process managers, control specialists</li> </ul> |
| <b>Participants</b>         |          | Minimum 3 / Maximum 8  |
| <b>Training Days</b>        | Laby     | 3-day or 5-day training  |
| <b>Training Options</b>     | Prognost | 2-day training in addition to the Laby® training   |
| <b>Languages</b>            |          | English, German  |
| <b>Training Dates</b>       |          | To be agreed   |
| <b>Tailor-made training</b> |          | Customized training courses can be developed to suit your exact requirements. Please contact the Training Center for further Information   |

Training is not limited to Burckhardt compressors. Training on Non-Burckhardt compressors can also be provided.

#### **Other available trainings**

General reciprocating compressor training

Hyper compressor training

Process gas compressor training

Laby®-GI compressor training

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## LABY®

### 3-Day training program (Theory & hands on)

1. INTRODUCTION
2. GENERAL LABY® INTRODUCTION
  - a. History and development of Laby® compressors
  - b. Different types and applications
3. COMPRESSOR DETAILS & DESIGN FEATURES
  - a. In depth understanding of the component functions. Focuses on cylinder, piston, valves, crank gear, bearings, guide bearings, oil scraper rings and crankshaft seal.
4. INSTRUCTION MANUAL
5. GENERAL MAINTENANCE TOPICS (HANDS ON THE COMPRESSOR)
  - a. Clearance check piston & cylinder
  - b. Clearance check crank gear
  - c. Dismantling valves, piston, oil wipers, piston rod gland
  - d. Dismantling guide bearing, shaft seal, relief valve, oil pump
6. VALVES THEORY
  - a. Burckhardt valve portfolio
  - b. Understanding the design features and optimal application of the Burckhardt valves
  - c. Introduction to the function principles of valves and sizing
  - d. Learn about valve failure and prevention
  - e. Visiting valve production in the workshop
7. COOLING AND LUBRICATION
  - a. Overview of compressor cooling system.
  - b. Cooling water requirements
  - c. Crank gear lubrication
  - d. Lubricating oil overview and requirements
  - e. Lubrication systems
8. TROUBLE SHOOTING
  - a. Discuss possible problems
  - b. Dealing with emergencies
9. DISCUSSION AND Q&A
10. FINAL TEST

## LABY®

### 5-Day training program (Theory & hands on)

1. INTRODUCTION
2. GENERAL LABY INTRODUCTION
  - History and development of Laby® compressors
  - Different types and applications
3. COMPRESSOR DETAILS & DESIGN FEATURES
  - In depth understanding of the component functions. Focuses on cylinder, piston, valves, crank gear, bearings, guide bearings, oil scraper rings and crankshaft seal.
4. INSTRUCTION MANUAL
5. GENERAL MAINTENANCE TOPICS (HANDS ON THE COMPRESSOR)
  - Clearance check piston & cylinder as well as crank gear
  - Dismantling valves, piston, piston rod gland
  - Dismantling guide bearing, shaft seal, relief valve, oil pump
6. VALVES THEORY
  - Burckhardt valve portfolio
  - Understanding the design features and optimal application of the Burckhardt valves
  - Introduction to the function principles of valves and sizing
  - Valve failure and prevention
  - Visiting valve production in the workshop
7. ELECTRICAL, INSTRUMENTATION AND CONTROL
  - Instrument types
  - Explosion protection and emergency stop
  - Voting of instrumentation
  - Documentation
8. COOLING AND LUBRICATION
  - Overview of compressors cooled parts
  - Cooling water requirements
  - Crank gear lubrication
  - Lubricating oil overview, requirements and systems
9. TROUBLE SHOOTING
  - Discuss possible problems
  - Behavior in emergency situations
10. CASE STUDIES
11. DISCUSSION AND Q&A
12. TEST

## PROGNOST SYSTEM

2-Day optional training program (Theory and computer hands on)

### 1. INTRODUCTION

### 2. START UP

- Start of VISU
- Systems connection
- Windows and desktop
- Machine status
- Warning and alarm colors
- DSC data

### 3. ONLINE DATA

- Basic knowledge
- Online diagram
- Scaling
- Using online compositions
- Daily snapshot

### 4. TREND DATA

- Basic knowledge
- Trend diagram
- Scaling
- Using trend compositions
- 3D trend effects

### 5. RINGBUFFER

- Basic knowledge
- View data
- Using data trend compositions
- Triggering user ring buffer
- Specific ring buffer analysis

### 6. LOGBOOK

- Logbook
- One Click-fast check

### 7. PRESENTING OF SIGNALS ANALYSIS

- Basic knowledge
- Type: Vibration (acceleration and velocity)
- Type: Dynamic pressure (time based and pV)
- Type: Displacement (Proximity – rod/plunger position)
- Machine depending analysis (power, hours, losses, rotation and torque)

### 8. ADDITIONAL TOPICS

- Signal plausibility
- Operations conditions
- Warning thresholds
- a. Safety limits
- b. VISU options

## GENERAL INFORMATION

### Travel to Switzerland

Participants arriving at Zürich Airport are kindly requested to travel by train to Winterthur.

The railway station is located in the airport building itself.

Direct trains to Winterthur are available every 15 minutes. Travelling time is approx. 15 minutes.

### Recommended hotels in Winterthur

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| <u>Hotel Banana City</u><br>www.bananacity.ch/en<br>Schaffhauserstrasse 8<br>CH - 8400 Winterthur<br>Tel. +41 52 268 16 16<br>E-Mail: info@bananacity.ch           | <u>Hotel Wartmann Best Western</u><br>www.wartmann.ch/en/home<br>Am Bahnhof Winterthur<br>Rudolfstrasse 15<br>8400 Winterthur<br>Tel. +41 52 260 07 07<br>Fax +41 52 213 30 97<br>E-Mail: wartmann@wartmann.ch |
| <u>Park Hotel Winterthur</u><br>phwin.ch/en<br>Stadthausstrasse 4<br>CH-8400 Winterthur<br>Tel +41 52 265 02 65<br>Fax +41 52 265 02 75<br>E-Mail:welcome@phwin.ch | <u>Plaza Hotel Winterthur</u><br>www.plazahotel.ch<br>Technikumstrasse 12,<br>8400 Winterthur<br>Tel +41 52 212 15 15<br>E-Mail: info@plazahotel.ch  |

### For more information

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