INFORMATION and TECHNICAL DESCRIPTION

Professional

Compressor management

• Automatically optimised • self-learning • simple installation and operation •
AIRLEADER - has been the effective answer for compressed air users for more than 10 years
- for the optimum compressor combination at any time
- suitable for the current compressed air consumption
- with proven lower costs and wear of the compressors.

Several studies have shown that the costs for compressed air generation are up to 30% higher than they should be. About 10% of the energy in the industry is used for compressed air generation with an increasing demand.

AIRLEADER - is self-learning
- with automatic optimisation
- is easy to handle
- monitors the compressed air station
- informs on service and fault messages

Compressed air is an important matter. Thus, in more than 20 years of planning and sales of compressor stations, the demands of the compressed air users have been compiled and have been realised in the new series AIRLEADER Professional.

AIRLEADER - shows the current compressed air consumption
- keeps the pressure constant
- monitors the pressure dew point
- integrates the frequency-controlled compressor
- dynamises the process of the compressed air stations

The costs for compressed air generation are being reduced by up to 27% when AIRLEADER reduces the load kW costs up to 20%, the idle running kW costs up to 99%, the wear with the compressors by more than 50% and the service costs by 30%.

Compressor-Management is the first step of a program for saving compressed air costs.
1. Expansions at the AIRLEADER controller

1. An operating system is played into the controller. The program flow only is on the Eprom
2. Optimizing the compressor combinations dynamically and automatically by 8 selflearning calculation processes adapted to the real air consumption. For lower energy costs
3. Dynamicly compressor changings at equally compressors without pressure drop within the pressure band
4. Active processing of the analog signal of the various speed regulated compressor
5. Free programmable maximum regulation range for speed regulated compressor
6. Free programmable minimal regulation range for speed regulated compressor
7. Direct switching on further compressors in the pressure band if production needs more compressed air
8. Direct switching off compressors within the pressure band if the speed regulated compressor has reached its minimal regulation range
9. Analog output for the external pressure advertisement over the pressure area
10. Analog output for the external compressed air consumption advertisement
11. Analog input for the supervision of the pressure dewpoint or room temperature
12. Alarm report when dewpoint or pressure, over or underrun the limited values
13. Dewpoint at the display (press + button)
14. 30 times faster communication between AIRLEADER the PC and Master-Slave

2. Expansions at the PC Program

1. Windows 2000 and WINDOWS XP fit
2. Dewpoint diagram to show the damp in the compressed air
3. Compressed air consumption, pressure and pressure dewpoint
4. Advertisement in numbers in every view
5. Compressors status advertisement for every view in the status strip
6. Zoom lens areas 1, 3, 6 12 24 hours
7. Alarm and service report supervises service intervals and writes events like service transgression and disturbing reports in the monthly report
1. Compressor-Management-System

AIRLEADER combines compressors of different sizes to an optimum unit which automatically adapts to the production based on the current compressed air consumption.

It is made sure that it is always the most efficient compressor combination which generates the compressed air necessary for production, independent of the manufacturer and the performance. The system pressure remains within the smallest limits. It is seen that the costs are kept as low as possible.

The compressor performances and a common pressure difference are programmed in for all the compressors. Based on this information, AIRLEADER permanently calculates the current compressed air consumption and the volume of the compressed air system.

The self-learning 8-fold calculation depth makes it possible to adapt the compressors to the changes in consumption in a dynamic way.

Automatic compressor change as per compressed air consumption:

If all the compressors are on the same rank, they are working fully automatically and based on consumption. The priority of the compressors is adapted to the production process in real time and with a useful hysterisis calculation.

It is always the compressor combination with the lowest cycle rates which is running and thus with the lowest idle times.

Big compressors are only running when needed. The smaller compressors are running under load instead of idling with the big compressors.

The compressors auto-regulate the motor start limitations.

The speed-controlled compressor is actively integrated

The speed-controlled compressor transmits the information on the motor speed via its analogous output.

Parameterisation is effected as to the minimum and maximum quantity delivered in the AIRLEADER.

The analogous signal allows to continuously add further compressors with higher consumption and to remove them with lower consumption using programmable control limits.

If desired, switching over is effected automatically to a normal compressor with a very low compressed air consumption.

Manual priorities

The priority menu allows the compressors to work on different priority levels.

Compressors with a different size having the same priority then work again based on consumption.

This function is frequently used for reserve compressors or for compressors with heat recovery.
2. Additional control functions

Compressor running time compensation

For compressors with the same performance, a change time for the same operating hours can be programmed when they are on the same priority.

Each compressor performance group can be programmed using a different change time.

The change is effected taking the motor running times into account.

If a compressor has reached the programmed time difference to the compressor with the lowest time in the same performance group, the compressors are exchanged without any pressure loss within the pressure range.

The real time switch with multifunction has the following functions:
- Switch the compressors ON at production start and OFF at production end
- 3 programmable pressure profiles for pressure increase and pressure reduction
- switch 3 different manual priorities dependent on the time
- switch 2 additional devices such as dryer or valves ON/OFF

3. Compressor inputs

The status of the compressors is constantly monitored.

If a running compressor displays a malfunction within the pressure range or is switched off for service, its performance is taken over by other compressors.

If several compressors are needed to do this, addition is made time-delayed.

Load and total running times are stored for the individual compressors.
The operating hours are deleted, if required.

4. Information on the user display

The following information is permanently shown on the display:

- Compressed air consumption in m³/min
- current system pressure in bar
- Pressure dew point in °C (at the click of a button)

Compressor status is displayed with the three-colour LEDs:

- green  Compressor conveys
- yellow  Compressor is idling
- red  Compressor displays a malfunction
- red blinking  Compressor is switched off
- LED off  Compressor is ready for use

5. Programming

Programming is effected using 4 keys

- Enter key  opens programming and confirms it
- Cursor  scrolls within the menus
- + key  increases the value
- - key  reduces the value
6. Digital inputs and outputs

Digital inputs for:

1. START/STOP of the compressors externally
2. Programming release
3. Time switch activation
4. second pressure profile or second priority

Digital outputs for:

1. Minimum pressure and malfunction of unit as well as exceeding of dew point
2. Collective fault compressors
3. two time switch outputs for switching of additional devices such as dryer, filter etc.

7. Analogous inputs and outputs

Analogous inputs 4-20 mA for:

1. Pressure transmitter for pressure monitoring (Standard 0-16 bar)
2. Signal of speed-controlled compressor via speed
3. Monitoring of ambient temperature or compressed air humidity using the dew point sensor

Analogous outputs 4-20 mA for:

1. Pressure range over the range preset by the pressure transmitter
2. Compressed air consumption in m³/min up to the maximum performance of the compressors

8. Scope of delivery of Hardware

Triggering of the compressors is effected using the relay cards supplied with potential free change-over contact.

Each compressor informs of its status such as motor running, malfunction and readiness for use via contacts.

AIRLEADER in metallized housing for wall mounting
Relay card for every compressor (top hat rail mounting in compressor control cabinet)
Transmitter for the current pressure detection with analogous output 4-20 mA
RS-485 serial interface for PC und Master-Slave connection
# Technical details and list of equipment

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<th>2</th>
<th>4</th>
<th>8</th>
<th>Master 4</th>
<th>Master 8</th>
<th>Slave 2</th>
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<td>control system ON/OFF, 2 switching outputs for triggering of additional devices (e. g. dryer or automatic actuators etc.)</td>
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<td>Interface RS 485 for PC and Slave connection</td>
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## Technical data:

- **Mains voltage**: 230 V AC 50 Hz
- **Compressor performance**: 0.1 - 200 m³/min
- **Pressure range**: 0 - 16 bar
- **Minimum pressure difference**: 0.3 bar
- **Inputs and outputs**: 24 V DC
- **Cable ducts**: Thread M 16 x 1.5
- **Optional**: 0 – 2.5 bar 0 – 50 bar 0 – 400 bar Vacuum 0 to -1 bar
1. Compressed air visualisation

The PC program „Compressed air transparent“ records the control process up to one second. At any time, it is possible to persuade oneself of the fact that the compressed air volume necessary for production is generated by the suitable compressor combination. Different diagrams show the efficiency of compressed air generation. The integrated calculation program lists the running times of the compressors as to load and idle times and calculates the energy consumption. The capacity and the work load of the compressors compared to the energy used gets more transparent. This make a more detailed cost control of the compressed air generation possible.

2. Diagrams in the Online view

- Compressed air consumption diagram in m³/min
- Pressure diagram in bar
- Pressure dew point diagram in °C DTP
- Total diagram for compressed air consumption, pressure and compressor status
- Diagram of the current capacity of the speed-controlled compressor

The status line displays the current status of the compressor in the form of a symbol

- green = Load
- yellow = Idle running
- red = Fault
- blue = not ready

In addition, the compressed air consumption, the pressure and the pressure dew point are shown with digits in the diagram views. (dew point only if a dewpoint sensor is connected)

3. Diagrams in the daily evaluation view

- Compressed air consumption diagram in m³/min
- Pressure diagram in bar
- Pressure dew point diagram in °C DTP
- Total diagram for compressed air consumption, pressure and status of compressors
- Capacity of the speed-controlled compressor
- Load time, idle time, fault message of compressors switched off for service
- Efficiency diagram as per load and idle running Kilowatt
- Energy calculation table with compressed air consumption data

Zoom range 1, 3, 6, 12, 24 hours, for the graphical diagrams

4. Diagrams in the weekly evaluation view

- Compressed air consumption diagram in m³/min up to 7 days in different colours
- Energy calculation table with compressed air consumption data
- Efficiency diagram as per load and idle running Kilowatt
- Energy calculation table with compressed air consumption data

The data for the evaluation can be stored weekly, monthly, quarterly or annually.
5. service and alarm report

The running hours of the compressors for load and idle running are written down on the service mask. For every channel at the AIRLEADER, there are 4 freely definable ways of services as time intervals will certainly.

After programming the compressor running times and the different service intervals the entered times belong backward to 0.

Is this report is gone off a time taken on time exactly in the monthly report. The number counts go into minus and will show red. A service warning appears on the screen.

Interval can respectively one by one moved back by the "R" button (Resetbutton) on the before oriented interval times

If a compressor or additional equipment goes on fault status also is taken on this monthly report and an alarm warning appears on the screen.

By the fault reports piling themselves up damages become at the compressors and production plants (by damp compressed air), recognized early. The open monthly report in table representation will help.

6. service input mask
### AIRLEADER Professional ALARM + SERVICE REPORT

+ shows alarm messages + shows service messages +

#### AIRLEADER Compressor-Management

<table>
<thead>
<tr>
<th>NAME OF CUSTOMER</th>
<th>Alarm messages</th>
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<tr>
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<td>Complete events</td>
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#### Alarm + Service Report

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#### compressor events

- compressor 1
- compressor 2
- compressor 3
- compressor 4
- compressor 5
- refr. dryer 1
- refr. dryer 2
- refr. dryer 3
- refr. dryer 4
- refr. dryer 5

#### daily events

- 01:00
- 02:00
- 03:00
- 04:00
- 05:00
- 06:00
- 07:00
- 08:00
- 09:00
- 10:00
- 11:00
- 12:00
- 13:00
- 14:00
- 15:00
- 16:00
- 17:00
- 18:00
- 19:00
- 20:00
- 21:00
- 22:00
- 23:00
- 24:00
1. The compressed air station communicates automatically

The ALARM and SERVICE MANAGEMENT is closely working together with the PC program “Compressed air transparent”. Fault messages as well as service messages are stored. Upon activation of the transmitting function, the messages are transmitted via modem or Fritz-Card to fax machines, via e-mail or as short message via SMS to mobile phones. The fault messages and service messages of the compressors and additional devices are recorded up to one second and are stored in the monthly report for alarm and service. Frequently available fault messages allow to determine damages with compressors and production plants at an early time (using humid compressed air). The clear monthly report in tabular form is a real help.

2. ALARM messages

The compressors connected to the fault inputs of AIRLEADER are stored and actively processed. The remaining free inputs allow for the connection of fault messages of filters, Bekomates, refrigeration dryer/adsorption dryer.

3. SERVICE messages

With commissioning of the ALARM and SERVICE MANAGEMENT, the total hours and load hours of the compressors are initially programmed. The times thus accumulated are updated every 60 minutes. The intervals of up to 4 freely definable items, such as air filter / oil filter / oil separator / and oil change can be freely determined.

4. Monthly report for ALARM and SERVICE messages

The alarm and service messages are stored in a monthly file. With every new message, the monthly file is sent in tabular form to the address defined before by fax or e-mail. The events are continuously numbered and added with date and time and stored one below the other. In the course of the day, the events are additionally numbered. The monthly report can be printed out at any time using the print menu.

5. Sending of messages

- Monthly report via fax
- Monthly report via e-mail
- Short message via SMS

The following selection functions can be determined:

- Alarm and/or service message
- 2 different fax configurations with 3 different fax numbers each
- 2 different e-mail configurations with 3 different fax numbers each
- 2 different SMS configurations with 3 different fax numbers each

5. Monitoring of analogous inputs

- Min – Max message with exceeding or not reaching the pressure
- Min – Max message with exceeding or not reaching the dew point
- Monitoring of the capacity of the speed-controlled compressor
5. Monitoring of analogous inputs
**Scope of supply to the AIRLEADER Professional upgrade** (Articlegroupe 20)

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<th>For AIRLEADER Type 0201, 0401, 0801, 1401, 1801</th>
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<th>AIRLEADER 4</th>
<th>AIRLEADER 8 and Master 4</th>
<th>AIRLEADER MASTER 8</th>
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**Additional products for the AIRLEADER Professional UPGRADE:**

**DEWPOINT SENSOR**, measuring range -50 bis +30 °C DP, pressure max 70 bar with 4-20 mA Analog output | 660,--€ |

**ALARM and SERVICE-MANAGEMENT** In connection with Visualization PC-programm and modem or Fritz-Card. Messages for alarm and services to Fax, -e-Mail, -SMS. Monthly alarm and service reports. Adjustable intervals for airfilter, - oilfilter, - oilseparator, oil changing time for compressors. A minimum and maximum alarm limit can be set to the dewpoint | 460,--€ |

**Interface** - RS485<>RS232 to connect AIRLEADER RS485 to PC. Incl. DB-9 cable and power supply | 210,--€ |

**Ethernet interface** - RS485<>Ethernet with RJ45 connection to computer networks. Freely definable TCP/IP address. Incl. communication software for virtual COM-Port and power supply | 410,--€ |

All prices FOB factory excludet packaging costs. The products remains our property until the complete payment. We only accept conditions of the german electric industries. We reserve to the right to make technical changes and improvements without notice at any time.