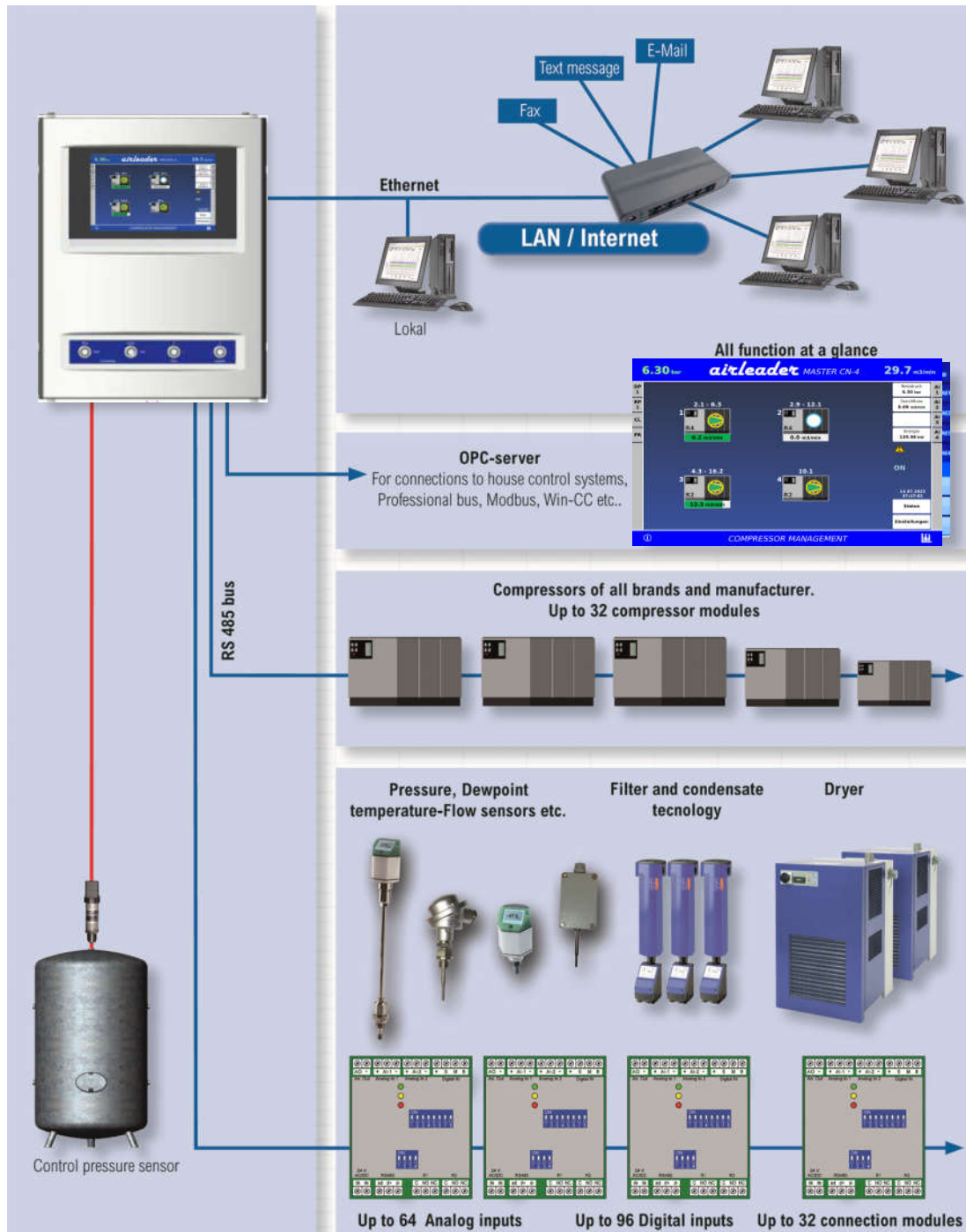


# Operation manual for Compressor-Management AIRLEADER Master-4



WF STEUERUNGSTECHNIK GMBH

# SUMMARIES

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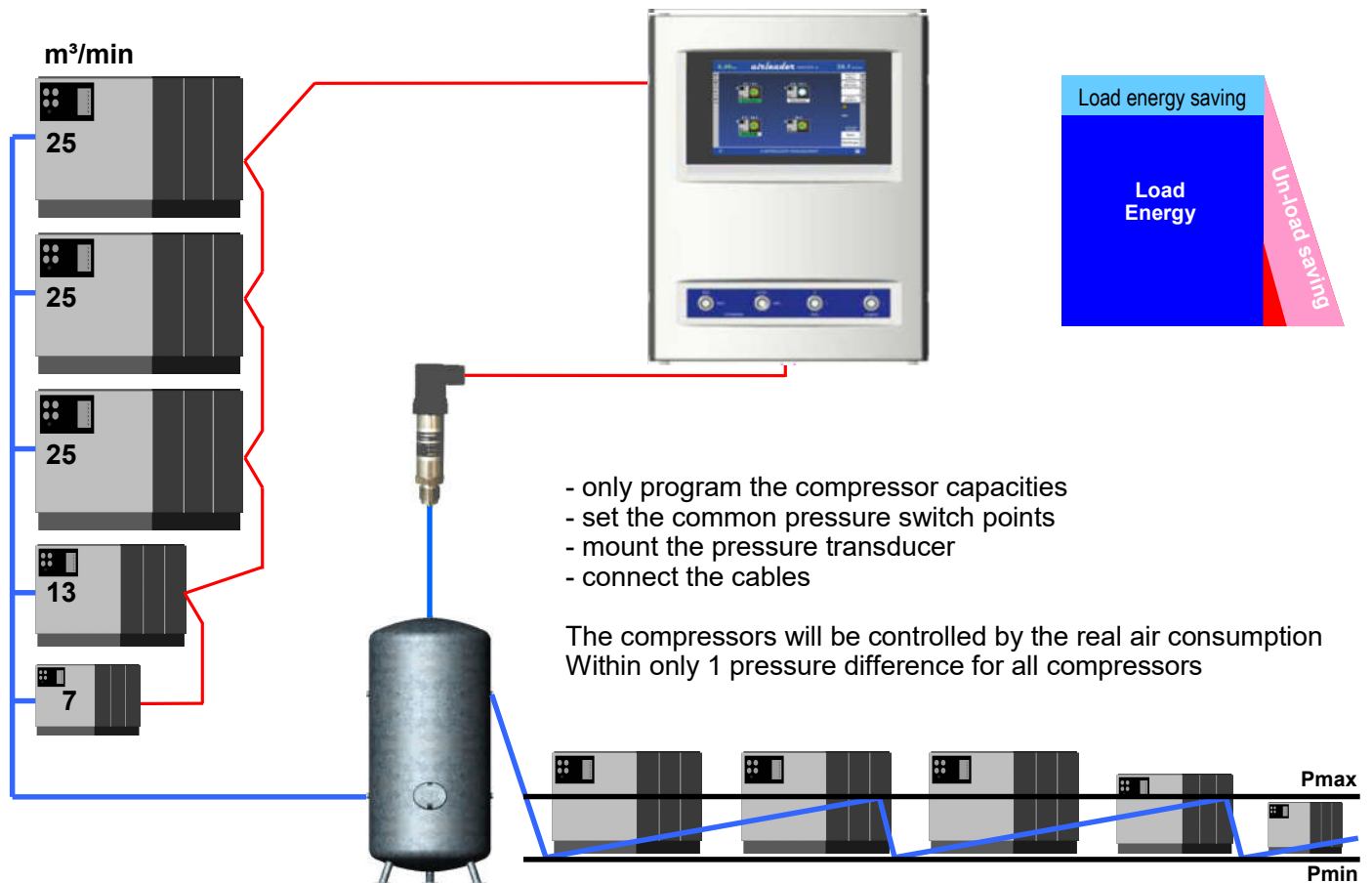
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## AIRLEADER combines compressors of different sizes to an optimum unit

Almost the best strategy to save energy



For program version, serial number and network touch >Status >Control and SD Card

### System information

**Serial no:** 3203-00010968

**Model:** Master CN II+

**Firmware Version:** 3.00565 (23.06.2022)

**MAC adress:** 50.2D.F4.0F.C4.08

**IP:** 192.168.0.145

**Net mask:** 255.255.255.0

**Gateway:** 192.168.0.239

**max VSD:** 6

**Memory size:** 29.1 GB

**Files on SD card:** 161

**Systemload:** 26 %

**Systemtemp:** 69 °C | 156.2 °F

Add-Ons:

- 6 VSD
- Modbus Data Extention
- OPC UA
- SIS Counter
- UDP COM-Server

COM Ports
Close

# FUNCTIONAL DESCRIPTION

## **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 real air consumption. The priority of the compressors is adapted to the production process in real time with a useful hysteresis 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 the big compressors. The compressors auto-regulate the motor start limitations.

## **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.

## **Connecting of compressors**

is effected using the connecting moduls this being installed in the electrical housing of the compressor on the DIN-rail. The connection to the Master control is made over the industry us RS 485 bus. The operating voltage of **24 volts AC/DC** can be attached to the tension supply of the compressor. **If a power supply of 24V AC or DC is available from the compressor electric.**

## **Compressor fault**

If a compressor goes on fault the display shows a symbolic cross. On fault of reported compressor the performance gets the compressed air consumption the most favorable compressors combination replaces through this one. The fault report for the compressors is activated at the AIRLEADER an common fault signal.

Faults from the connection modules will be given out over the digital output „General fault of external equipment.

## **Compressor motor running**

If these inputs get connected, AIRLEADER receives the motor running time. The total hours are also stored as the load hours. The advertisement of the hours can be retrieved over the display. The running time compensation provides equally running times of compressors with same capacity.

## **Compressor ready input**

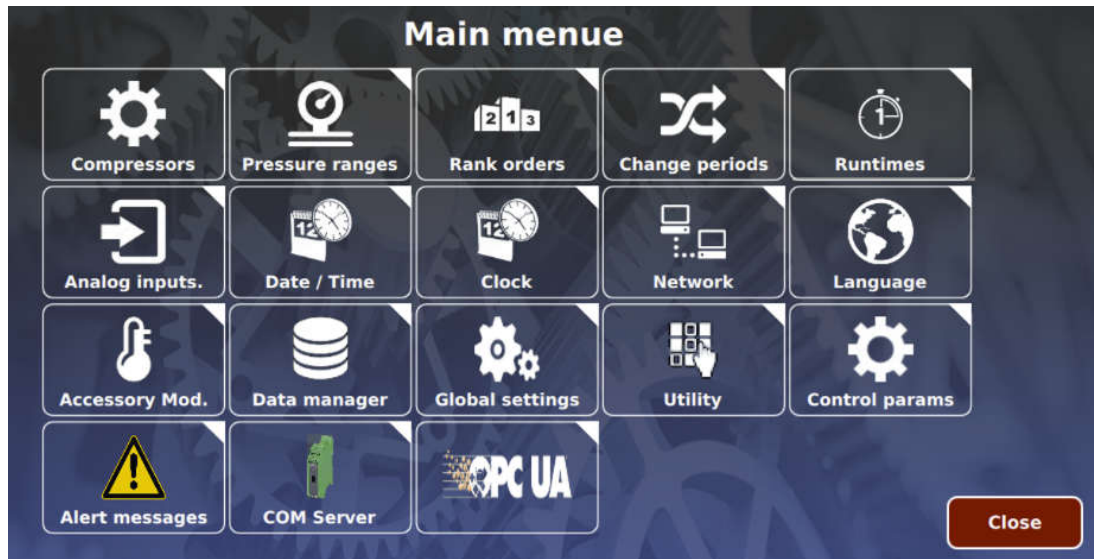
These input must be connected so that compressor management AIRLEADER recognizes the readiness of the compressors. If these input don't get connected, the compressor cannot be in operation. A fault signal isn't activated.  
der Kompressor nicht bereit und kann nicht ausgewählt werden. Eine Störmeldung wird nicht aktiviert.

## **If the fault input is not connected**

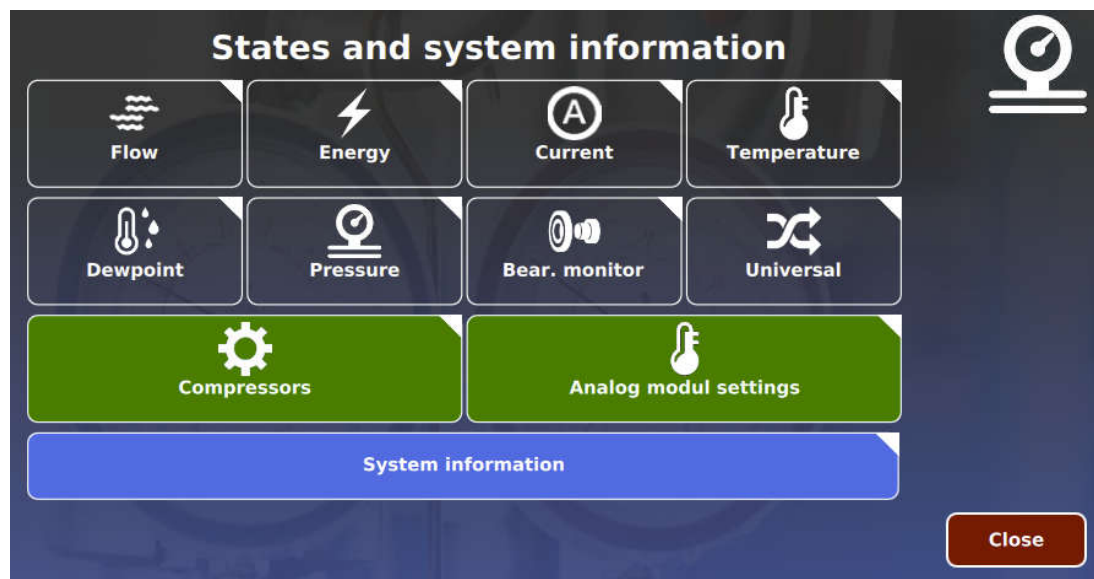
and one of the compressors stops due to a malfunction, the display will show a wrong compressed air consumption (too high = by the value of the faulty compressor). For this reason it is advisable to connect the malfunction signal inputs, so that the compressed air consumption is always shown correctly and the capacity is also corrected and immediately after reaching the P min.

## Main Menu, System information, Symbol Legend

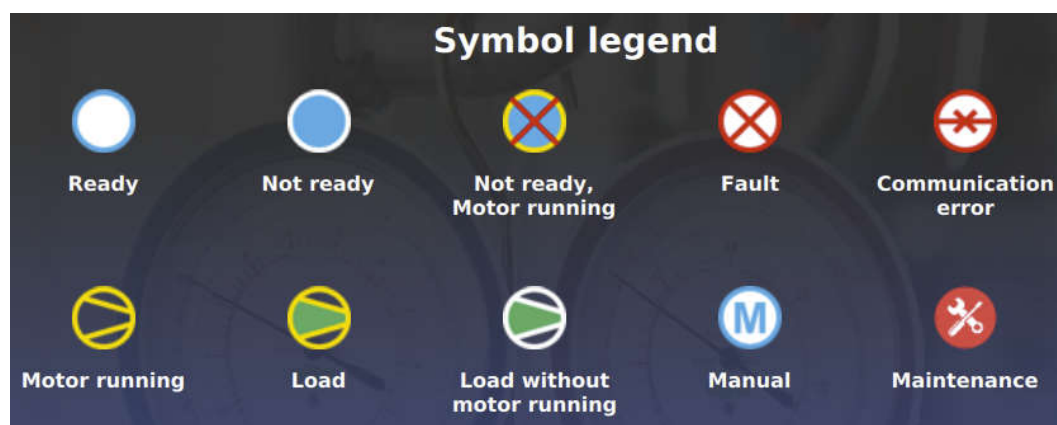
Touch „Program“ to enter the control settings



Status and Systeminformation -Touch „Status“-



Kompressor Status Symbole

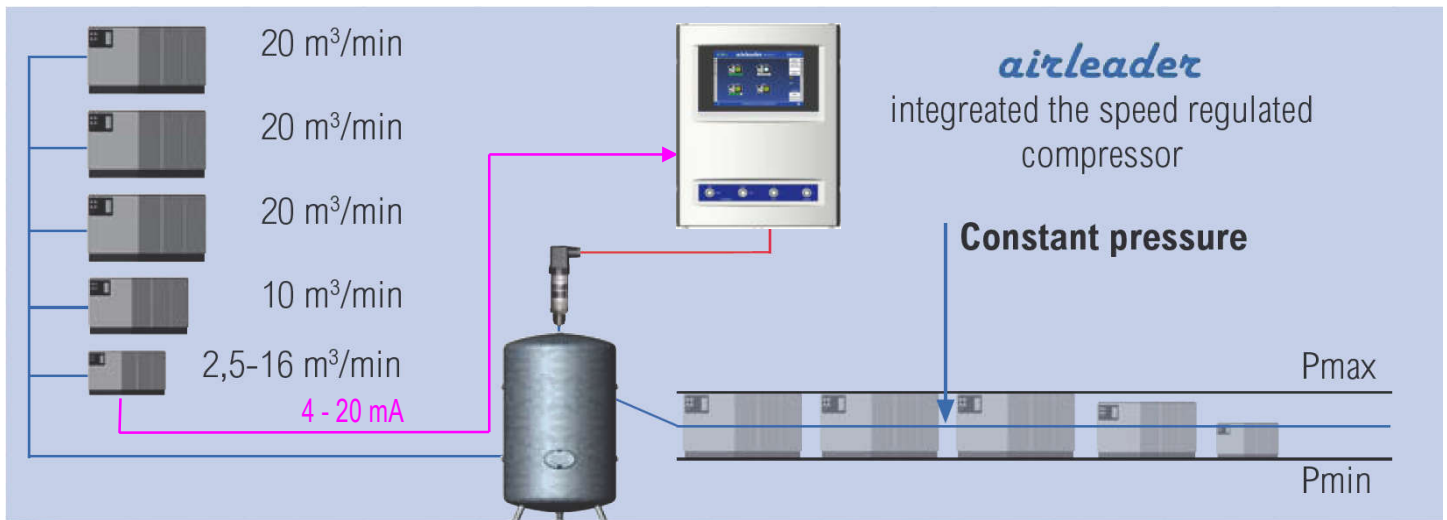


# Control and interpretation of regulated compressors

## The various speed regulated compressor is integrated actively

The VSD compressor send the information about the motor speed over an analog output to AIRLEADER. This parameter must be programmed to the minimal and maximum capacity of the delivered compressed air. The analog output of the VSD compressor have to be 4-20 mA. VSD Compressors with an analog output of 0-10 VDC must be changed from 0-10 VDC with a receiving multicoupler to 4-20 mA.

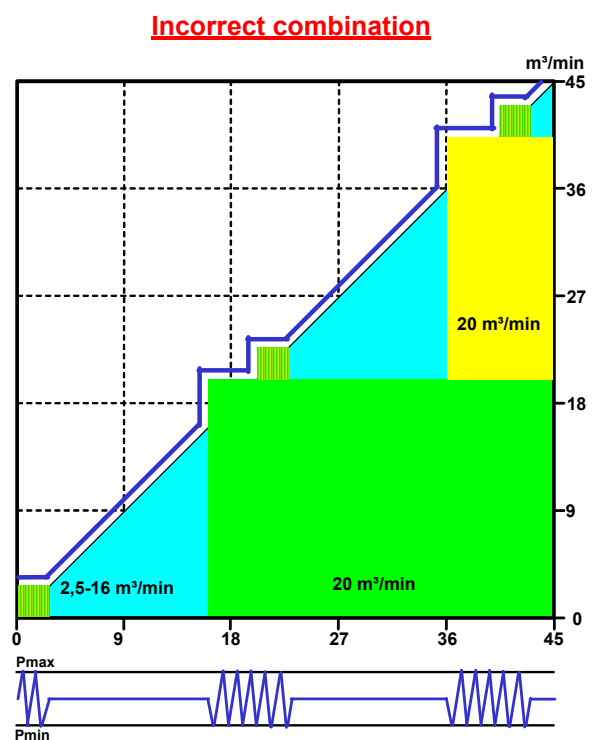
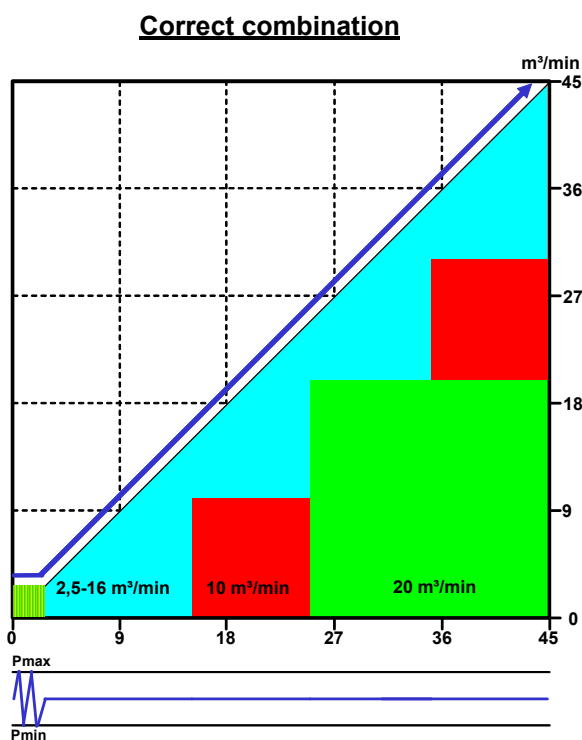
The pressure Setpoint of the VSD compressor must be centrally programmed between the AIRLEADER switch points.



## The right combination of compressor capacities

together with speed regulated and normal compressors with a firm performance is decisive for good results in regulation. Is the various speed regulated compressor the smallest in combination with only bigger compressors there are only small section regulated by the various speed compressor. Big mechanical hurdle cannot be regulated directly.

## Example of the right interpretation of the performances:





# Configuration of regulation range and regulation buffer

Example with a VSD Compressor with a regulation range between 2,5 - 16 m<sup>3</sup>/min -

## The free definable regulation range max

switches load/unload compressors ON and OFF within the pressure settings of AIRLEADER. The regulation limits are defined with the **regulation range max** and the **regulation buffer**. Is the **regulation range max** adjusted lower than the maximum capacity of the VSD, the **regulation range max** and the **regulation buffer** will be activated.

## Setting the "regulation range max"

Example: the **regulation range max** will be programmed to 15 m<sup>3</sup>/min. If than the compressed air consumption is going higher than 15 m<sup>3</sup>/min a time flexible trend calculation watches the compressed air consumption and switches another compressor on (10 m<sup>3</sup>/min like example). Within the pressure switch points of AIRLEADER. If the speed's regulated compressor reaches the **regulation range max** the second time together with the 10 m<sup>3</sup>/min compressor at 25 m<sup>3</sup>/min air consumption again, the 10 m<sup>3</sup>/min compressor will be replaced with the 20 m<sup>3</sup>/min compressor directly.

The 10 m<sup>3</sup>/min compressor will be switched on if air consumption reaches the **regulation range max** of the regulated compressor at 35 m<sup>3</sup>/min together with the 20 m<sup>3</sup>/min compressor.

## Setting the "regulation buffer"

Example: the **regulation buffer** will be programmed to 1,5 m<sup>3</sup>/min. If the compressed air consumption is getting lower and the regulated compressor comes to the point "lower than 15 m<sup>3</sup>/min" together with the 10 and 20 m<sup>3</sup>/min compressor the regulation buffer of 1,5 m<sup>3</sup>/min will be activated. The air consumption get again 1,5 m<sup>3</sup>/min lower a time flexible trend calculation stops the 10 m<sup>3</sup>/min compressor inside the adjusted pressure switch points at the AIRLEADER. The VSD compressor regualtes to the capacity of 13,5 m<sup>3</sup>/min.

### Correct setting of regulation buffer

Regulation range max	=	15,0 m <sup>3</sup> /min
Regulation buffer	=	-1,5 m <sup>3</sup> /min
Min compressor capacity	=	-2,5 m <sup>3</sup> /min
Control sum	=	11,0 m <sup>3</sup> /min

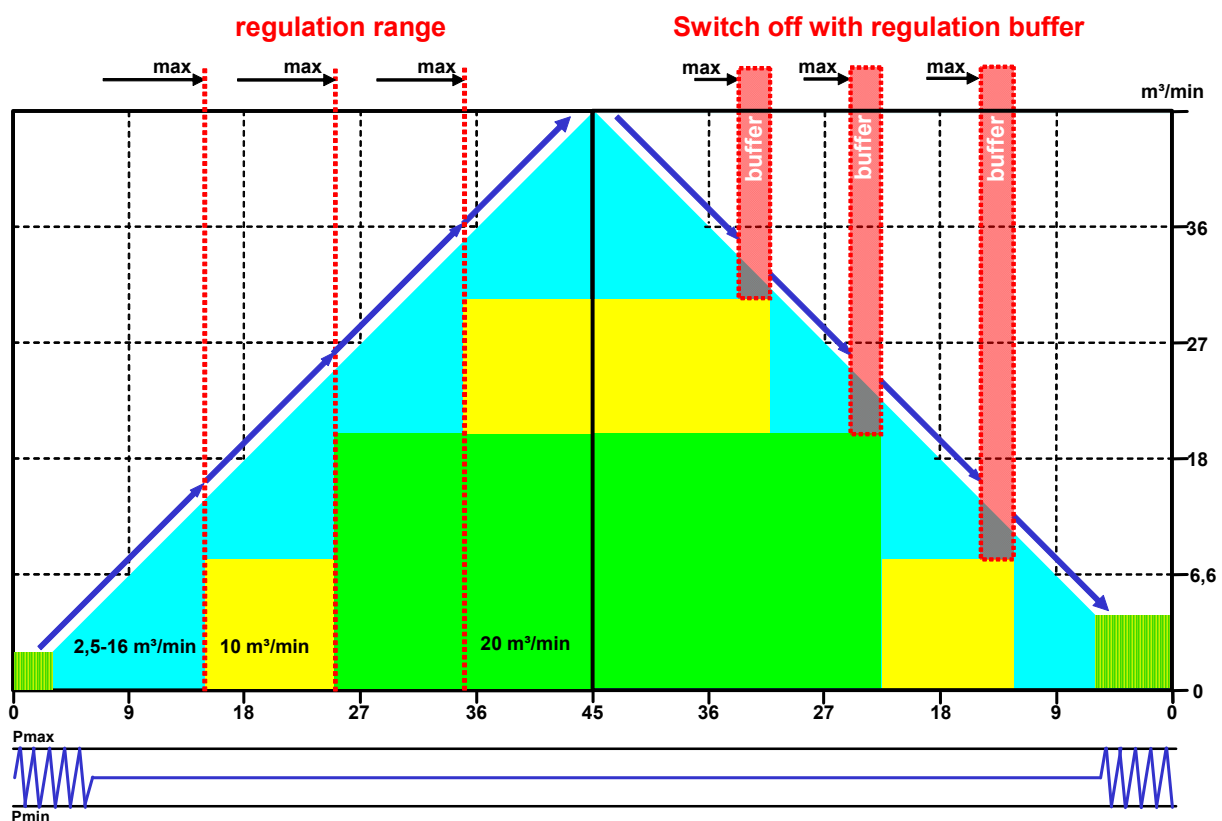
### incorrect setting of regulation buffer

Regulation range max	=	15,0 m <sup>3</sup> /min
Regulation buffer	=	-3,5 m <sup>3</sup> /min
Min compressor capacity	=	-2,5 m <sup>3</sup> /min
Control sum	=	9,0 m <sup>3</sup> /min

### Note:

- the **regulation range max** will be activ if the control sum is smaller than the capacity of the load/unload compressor
- the **regualtion buffer** is active if the controll sum is higher than the capacity of the load/unload compressor

The VSD compressor will be run in his best specific range.



# Minimum flow rate and remote pressure supply

## Settings „minimum flow rate“ of variable speed compressor

By setting the minimum capacity in the menu of the speed regulated compressor can be determined whether or below the minimum delivery amount of a normal compressor compressor in load / idle to run mode.

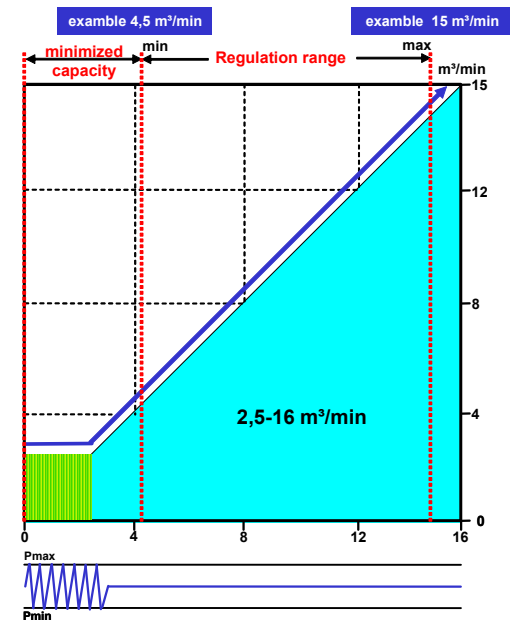
### Setting the minimum flow rate of 0 m<sup>3</sup> / min causes:

The speed controlled compressor is running in start / stop operation as long as the consumption of compressed air is from 0 to 2.5 m<sup>3</sup> / min.

### Setting the minimum flow rate of 2.5 m<sup>3</sup> / min causes:

Below 2.5 m<sup>3</sup>/min compressed air consumption a normal compressor is running in a load / unload mode. The downshift is receding in consumption with a hysteresis

This mode is only economic if the air station with a small compressor as 2.5 to 4 m<sup>3</sup> / min is installed in addition

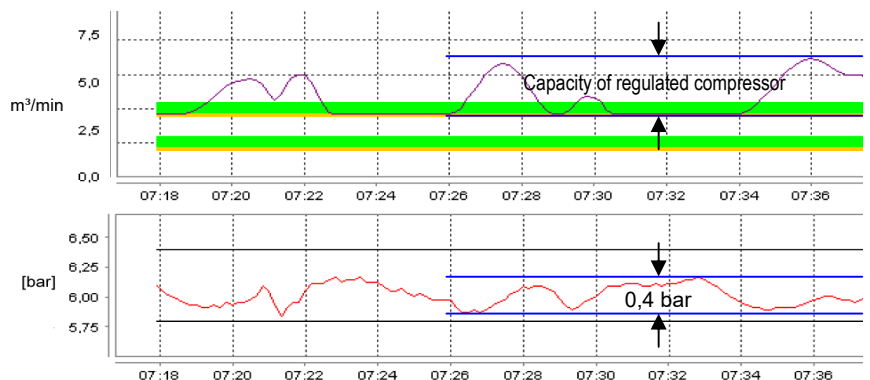


## Remote pressure supply through analog output at the RS-485 connection module

### Pressure differences caused by dryers and filters

cause may be between the pressure transmitter of the controlled compressor, and the master control rule up to 0.4 bar difference.

A precise control of pressure within very close limits is not possible. The pressure difference at the higher level control must be expanded by the pressure value can be set. This results in a pressure differential of 0.7 bar. (More than at a station without a regulated compressor)



### With the remote control actual pressure value

ensure that the regulated compressor can be operated in conjunction with the master control in a narrow pressure limit.

The analog output of the connection module, deliver the current actual pressure of AIRLEADER via 4-20 mA.

If the compressor pressure transmitter has an different range, than the output has to be adjusted accordingly.

### Example:

AIRLEADER 0-16 bar = 4-20 mA

Compressor 1-20 bar = 4-20 mA or Compressor -1-15 bar = 4-20 mA

### An offset value setting for remote actual pressure

can be programmed via the menu of regulated compressor to the pressure setpoint of the controlled compressor to adjust the pressure difference.

This is especially important when more than 1 controlled compressor is installed in the compressed air network and the analog values do not match the individual compressors



## Station with 2 variable speed compressors

### In a station with 2 regulated compressors

the pressure transducer of regulated compressors in the same place as the pressure transmitter of the AIRLEADER feel, because differences in pressure of compressed air dryers and filters, the control behavior can influence each other greatly.

The configuration is described on page 4.

### Settings „regulation range max“ und regulation buffer

**example 1:** 2 variable speed compressors with same capacity

compressor	compressor type	m³/min	Regulation range max	Regulation buffer	Min. flow rate
1	Variable speed	5-30	28 m³/min	5 m³/min	0
2	Variable speed	5-30	28 m³/min	5 m³/min	0
3	load / unload	15	-	-	-
4	load / unload	25	-	-	-

**example 2:** 2 variable speed compressors with different capacities

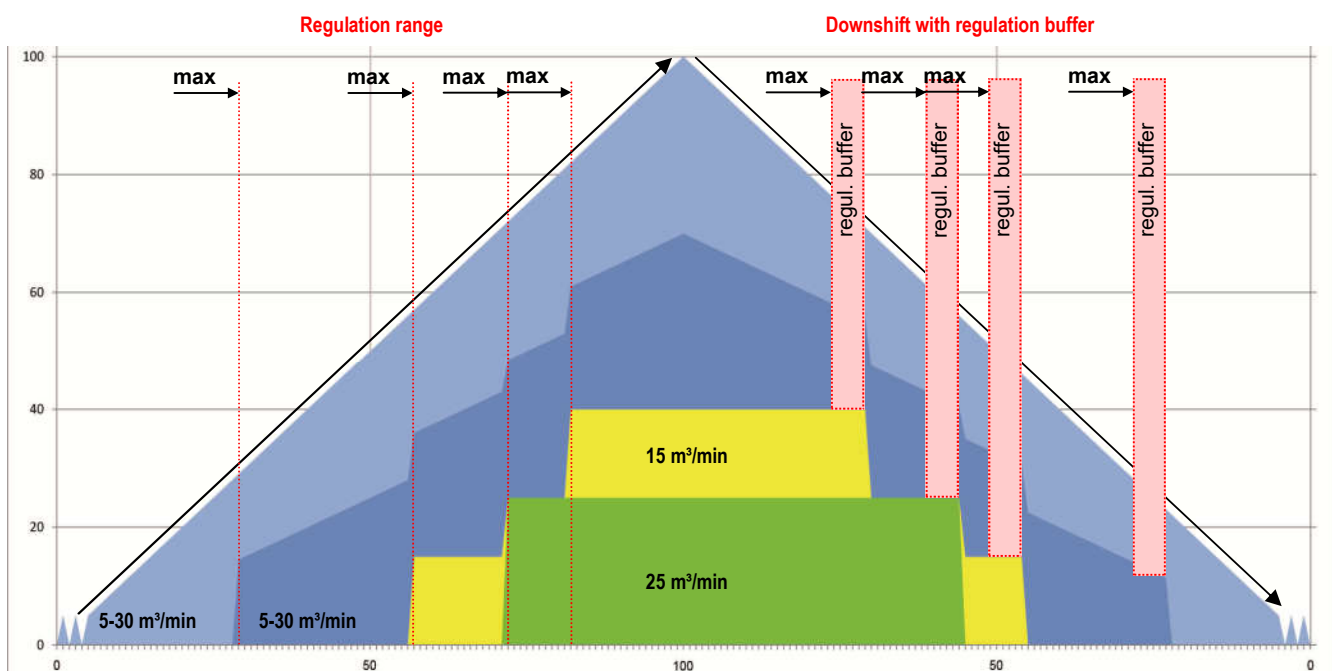
compressor	compressor type	m³/min	Regulation range max	Regulation buffer	Min. flow rate
1	Variable speed	1,5-10	9 m³/min	1,5 m³/min	0
2	Variable speed	5-20	18 m³/min	4 m³/min	0
3	load / unload	15	-	-	-
4	load / unload	25	-	-	-

### In example 2

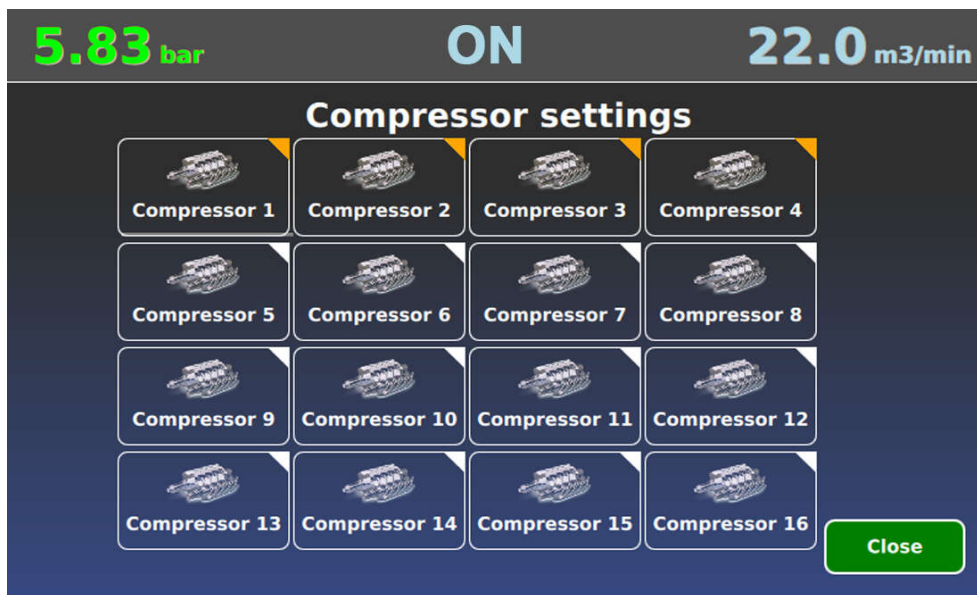
- if compressor 1 reach the regulation range max - it changes to compressor 2
- if compressor 2 reach the regulation range max - compressor 1 start again
- if both compressors reach the regulation range max - one of the load / unload compressor will be started
- the controller decides, dependent of air consumption that one of the regulated compressor can be switched off

### The regulation range max

ensure that regulated compressors are always in the correct specific area. If a variable speed compressor delivers more air than the setting of the regulation range max, the control started a flexible trend calculation to start the next load/unload compressor. Dependent of the compressed air consumption.



## Programming variable speed compressors



Touch >Settings >compressor  
than  
Touch > on compressor symbol

- > set min capacity
- > set max capacity
- > set lmax
- > set lmin
- > set regulation range max
- > set regulation buffer
- > compressor min air flow

### Attention:

Activate service for maintenance the signal "Ready" is deactivated and the compressor goes into idle when it is running on load

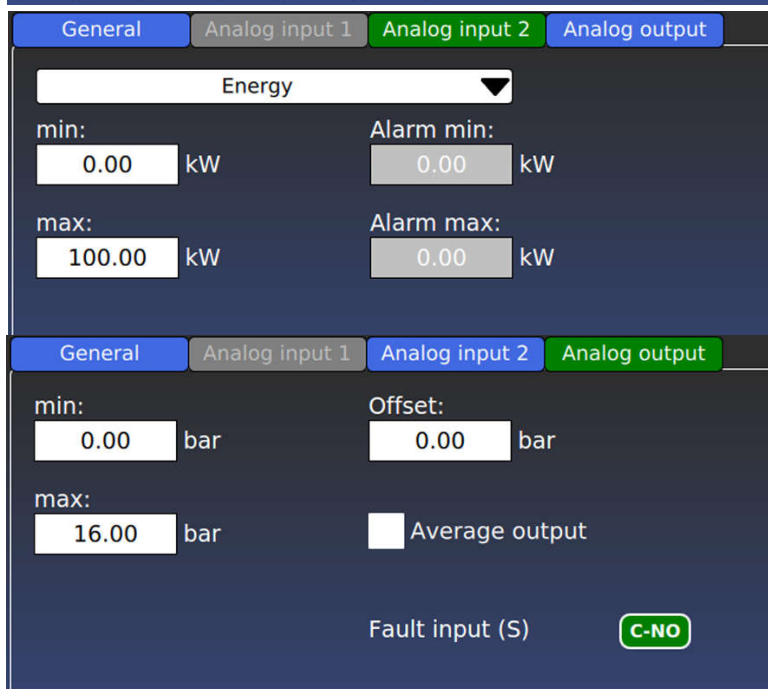


Install Sensor on Analog Input 2  
Touch on Analog input 2

- > select type of installed sensor
- > set min range of sensor at 4 mA
- > set max range of sensor at 20 mA
- > set min Alarm point
- > set max Alarm point

### Following sensors are possible:

- > Amperé
  - > Universal sensor
  - > Power (kW)
  - > Temperatur
  - > Bearing monitor
- If the sensor value is out of the Alarm setpoints, you will get an alarm on the Web-Server Visualisation



Touch on Analog output „AO“

- > set min and max range of the compressor pressure sensor at 4 mA and 20 mA
- > set max range of sensor at 20 mA
- > set pressure offset if it is necessary

### Don't select !Average value output

If average value output is selected the analog output signal ist the average between Pmin and Pmax of Airleader pressure setting

### Fault input selection

Standart is C-NC  
If necessary change to C-NO

# FU-Control for variable speed compressors

## FU-Control: (Switch on via the menu of the control parameters)

This function can be activated when several regulated compressors are working in the compressed air network. The condition here is that the controlled compressors are controlled via the analog output of the compressor module according to the network pressure. (ACTUAL pressure value) As a result, the compressors and the Airleader have the same pressure. Is one of the regulated compressors running in the uneconomic area, -e.g. at 100% or 30% for a longer period of time, the actual pressure value is changed slightly by 0.05 bar until the compressors are running in the good range again. Maximum adjustment 0.2 bar.

**FU-Control**

Sampling:	5000	ms
Min limit:	20	%
Max limit:	80	%
Offset increment:	0.010	bar
Max offset:	0.30	bar

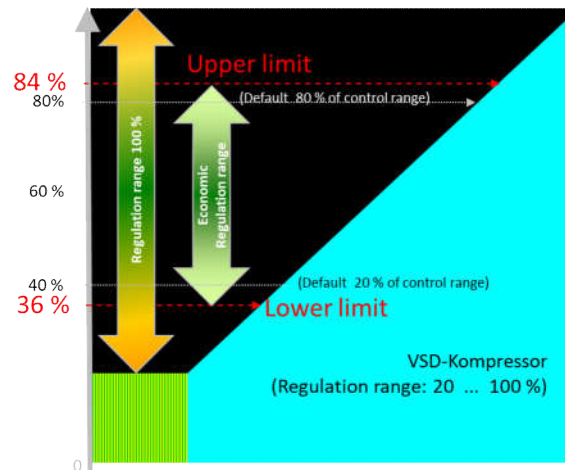
**FU-Control turn on**

**Save**

**Close**

- > **Sampling frequency with FU-Control**, controls the frequency of possible corrections
- > **offset increment**, Change in pressure values
- > **maximum offset**, Maximum change in print offset

Compressor capacity = 100 %



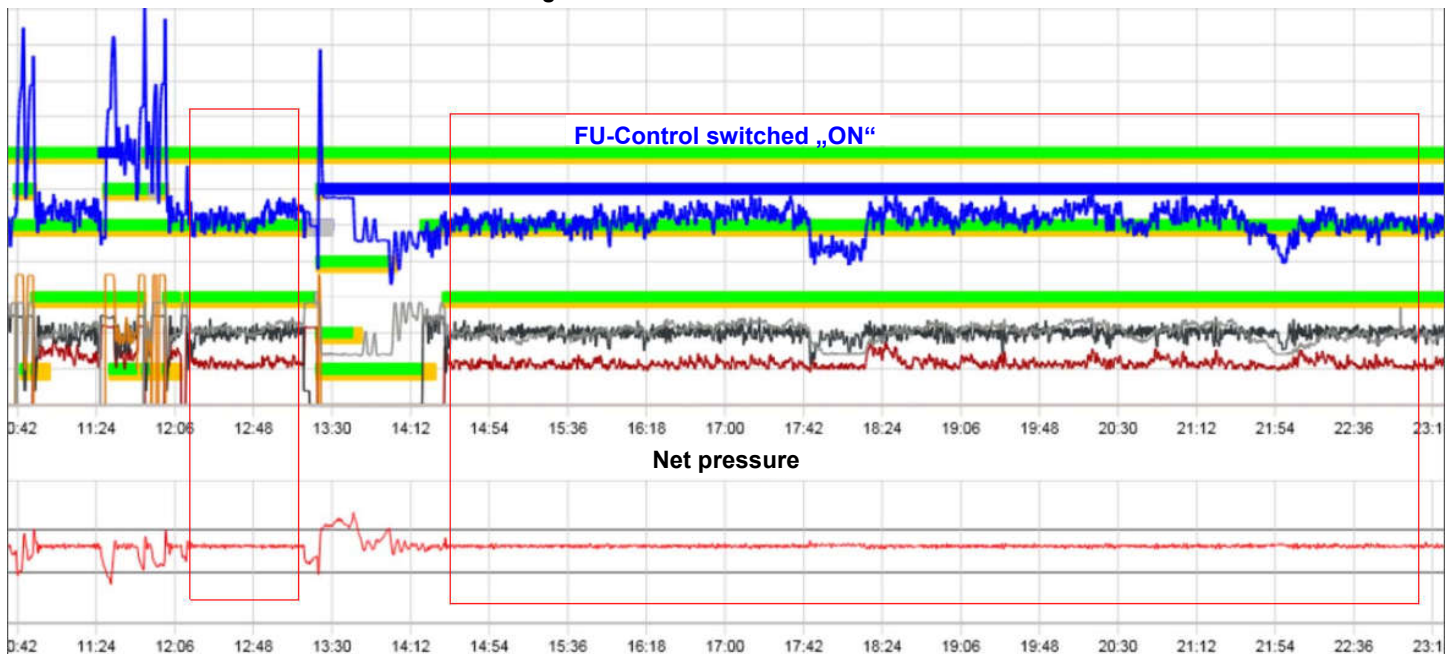
Setting the offset correction

> maximum limit,

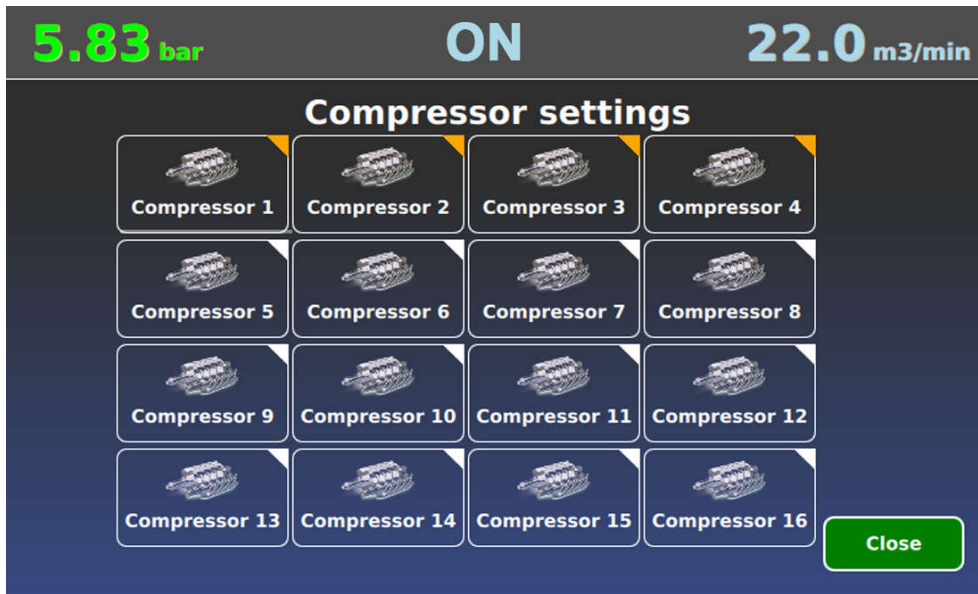
> minimum limit,

Minimum capacity = 20%

Diagram with – and without FU-Control

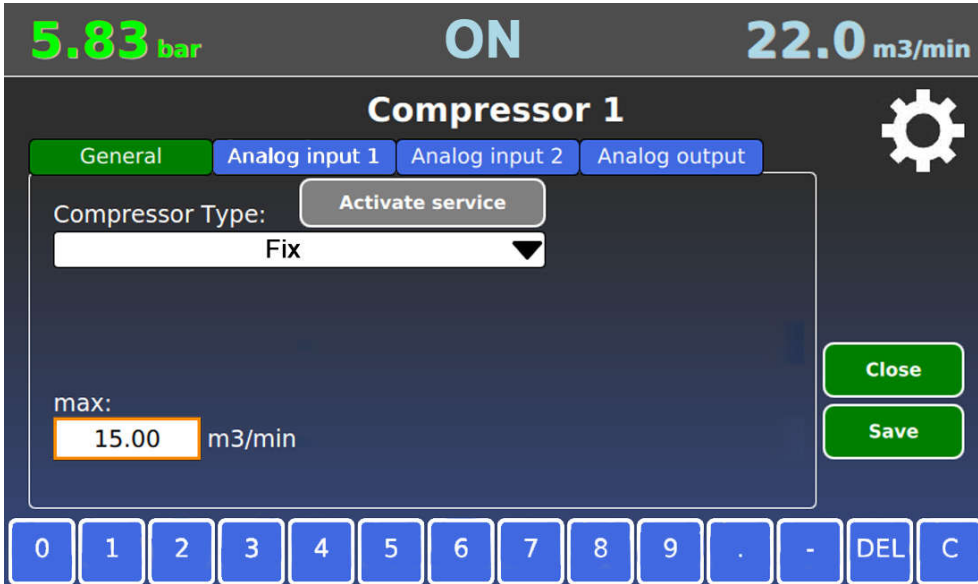


## Programming load / unload compressors



Touch >Settings >compressor  
than  
Touch > on compressor symbol

> set capacity



Touch on Analog input 1 „Ai-1“

- > set type of sensor
- > set min range of sensor at 4 mA
- > set max range of sensor at 20 mA
- > set min Alarm point
- > set max Alarm point

**Following sensors are possible:**

- > Amperé
- > Power (kW)

**Install Sensor on Analog Input 2**

**Touch on Analog input 2**

- > select type of installed sensor
- > set min range of sensor at 4 mA
- > set max range of sensor at 20 mA
- > set min Alarm point
- > set max Alarm point

**Following sensors are possible:**

- > Universal sensor
- > Temperatur
- > Bearing monitor

If the sensor value is out of the Alarm setpoints, you will get an alarm on the Web-Server Visualisation

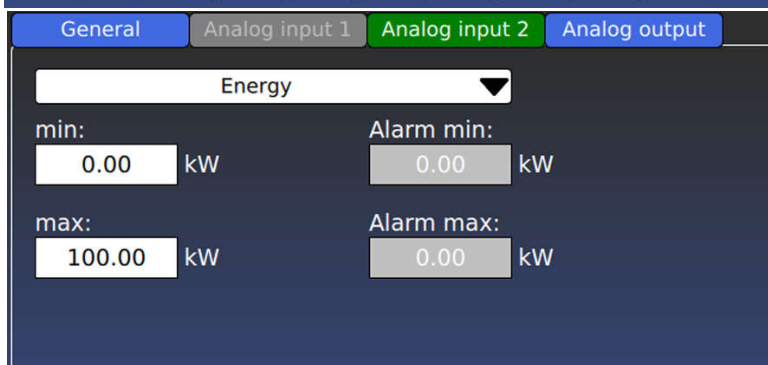
**If current measuremet is selected**

- > set min range of sensor at 4 mA
- > set max range of sensor at 20 mA

**If energy measuremet is selected**

- > set min range of kW meter at 4 mA
- > set max range of kW meter at 20 mA

**OPTION:** Vibration sensor  
Bearing monitor if Alarm and Service  
management is installed





## Pressure and rank profiles + system parameter

**Pressure ranges**

DP	pMin	pMax	pAlarm
1	6.00 bar	6.60 bar	3.00 bar
2	3.80 bar	4.80 bar	3.30 bar
3	4.10 bar	5.10 bar	3.60 bar
4	4.40 bar	5.40 bar	3.90 bar

if lower pMin higher pMax  
press. 0.00 bar 0.00 bar set compressors to manual mode

Save Close

### PRESSURE PROFILE

Menu „pressure switch points“.  
4 different pressure profile can be programmed. The pressure profile 2, 3, and 4 can be selected over:

- real time clock
- digital input 1, 2 and 3

### New function: "set compressors to manual mode"

If **-0.0 bar** is entered in the two fields "lower Pmin" and "higher Pmax", this function is not active.

If the pressure in the "lower Pmin" field is entered as **0.5 bar**, Airleader switches the compressors to manual operation, when this value is undershot. (Control compressor's with their own control)

If the pressure in the "higher Pmax" field is entered as **0.5 bar**, Airleader switches the compressors to manual operation if this value is exceeded. (Control compressor's their own control)

If the "automated manual mode" function is active, The "MAN" key switch has to be switched to "1" for a few seconds.

Then switch back to "0" to activate automatic operation via Airleader,

**5.83 bar** **ON** **22.0 m<sup>3</sup>/min**

**Rank orders**

RP/C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Close Save

1 2 3 4 C DEL

### RANK PROFILES

Menu „compressor rank profile“

**Example:** Following compressors shall be controlled

- compressor 1+2 with 20,0 m<sup>3</sup>/min
- compressor 3+4 with 18,0 m<sup>3</sup>/min
- compressor 5+6 with 12,5 m<sup>3</sup>/min

### Special request

- > Compressor 1 + 6 is connected to an heat recovery
- > Compressor 3 as standby only

### Recommended programming

- compressor 1+6 rank 1
- compressor 2+4+5 rank 2
- compressor 3 rank 3

Compressors in the rank stage 1 will be controlled dependent on the actual air consumption.

If this is not enough, the compressors of the rank 2 and helps rank 1

**ATTENTION:** Only compressor on the same rank stage will be controlled automatically by the dependent airconsumption.

**5.83 bar** **ON** **22.0 m<sup>3</sup>/min**

**Change periods**

Compressors with: 10.0 m<sup>3</sup>/min

hours: 24 minutes: 00

↻

### Time cycle compressor order

In this menu equal hour for compressors with the same capacity can be programmed.

## Control Parameter

**Control parameters**

Delay time start:	Minute	0	Sec.	30	<b>Security zones:</b>
Delay time below:	0	20	high:	0.20	below: 0.20
Delay time high:	0	20	Unit:	<input checked="" type="checkbox"/> m3/min	high: 0.20
FU average:	30	Sec.		<input type="checkbox"/> m3/h	

☐ Fix-Comp. if possible

**FU-Control** **Save** **Close**

### Control system parameter:

changing of this settings only with coordination by the manufacturer.

### Delay time start:

If Airleader is activated via the **"Start key switch or real time clock"** and the network pressure is lower than the settings of **Pmin value**, a compressor is switched on immediately. All other compressors will be switched on individually after the programmed time. Programmed rank profiles are taken into account. order from large to small.

### Security zone below:

If the demand for compressed air suddenly increases and the pressure drops below Pmin, further compressors switch on after calculating an additional demand. Or small compressors are replaced by compressors with greater capacity.

### Security zone high:

If the demand for compressed air drops suddenly down and the pressure rises above Pmax, more compressors will be switched off after programmed time and calculating a reduced demand.

Or larger compressors are replaced by compressors with smaller capacity.

### Delay time below:

This function prevents several compressors from being started when they are not required, because compressors start only after approx. 15-30 seconds producing compressed air. If a compressor was switched on in the below security zone, the next compressor will only be switched on after the programmed time has been elapsed.

### Delay time high:

If a compressor has been switched off at the high security zone, the next compressor will only be switched off after the programmed time. **Setting information: large receiver volume = longer time, small receiver volume = shorter time**

### FU average:

The analog output signal from the frequency inverter will be averaged with the programmed time.

The control process becomes more harmonious.

### Fixed compressors if possible: (Fixed capacity compressors – if possible)

If several speed-controlled compressors are installed in the compressed air network, in combination with compressors with a fixed output, these will be switched on as early as possible in order to increase the specific power.

The prerequisite for this is a sufficient large regulation range of variable speed compressors.

### FU Control: See page 11

This function can be activated when several variable speed compressors are working in the same compressed air network.

The condition here is that the variable speed compressors get the net pressure via the analog output of the compressor module according to the network pressure. (ACTUAL pressure value)

As a result, the compressors and the Airleader have the same pressure level.

Is one of the regulated compressors running in the uneconomic area, -e.g. at 100% or 30% for a longer period of time, the actual pressure value is changed slightly by 0.05 bar until the compressors are running in the good range again.

Maximum adjustment 0.2 bar.



## Analog - Inputs of Master

**5.83 bar** **ON** **22.0 m3/min**

### Analog input 2

☐ No sensor    ☐ Net pressure    ☐ Dewpoint  
☐ Temperature    ☐ Flow    ☒ Extra pressure  
☐ Current    ☐ Energy    ☐ Universal  
☐ Bear. monitor

min:  bar    Alarm min:  bar  
 max:  bar    Alarm max:  bar

**Close** **Save**

0 1 2 3 4 5 6 7 8 9 . - DEL C

**ANALOG inputs on Master Module** AIRLEADER Master has as standart 4 analog inputs  
 TO program the analog inputs > touch on the button of analog input

#### Analog input „Ai1“

only for pressure transducer. The pressure transducer extend the supply of AIRLEADER and is included. No other sensor should be connected to the system. The pressure is displayed in the display on the left head line.

#### Analog input Ai2, Ai3, und Ai4

can be used for following sensors:

- > Dew point
- > Temperature
- > Flow
- > Extra pressure
- > Current measuring
- > Energy measuring

**For each analog input** is an digital output available for alarm signals

#### Programming of alarm signals:

- > for minimum signal
- > for maximum signal

can be programmed for each connected analog sensor. The measurements of these sensors are displayed permanently.

#### Parameter setting of analog inputs for example:

- > 4 mA upper data (Tmin)
- > 20 mA lower data (Tmax)

The window for the alarm specification is programmable vacant within the sensor values.

## Analog and digital-inputs of connection modules

5.83 bar ON 22.0 m3/min

**Modul 17**

Analog input 1 Analog input 2 Digital in Analog output

Extra pressure

min: 0.00 bar Alarm max: 0.00 bar

max: 16.00 bar Alarm max: 16.00 bar

Close Save

0 1 2 3 4 5 6 7 8 9 . - DEL C

5.83 bar ON 22.0 m3/min

**Modul 17**

Analog input 1 Analog input 2 Digital in Analog output

S ☐ Fault ☐ Active ☒ Not active

M ☐ Fault ☐ Active ☒ Not active

B ☐ Fault ☐ Active ☒ Not active

Close Save

7.40 bar 0.0 m3/min

**Modul 33**

Analogeing. 1 Analogeing. 2 Digitaleing. Analogausg.

min: 0.00 bar Offset: 0.00 bar

max: 16.00 bar ☐ Mittelwertausgabe

☐ Schaltuhr R1,R2 umleiten auf Modul

Speichern Schließen

### Digital output R1 and R2 on the connection module

If the digital output function is activated on a module (17-24), the timer outputs are connected synchronously with those on the master. Timer output R1 on the master corresponds to digital output 7. R2 on master digital output 8

### ANALOG and DIGITAL inputs

Up to 8 connection modules can be connected for external analog sensors and digital potential free contacts of dryers, condensate drains etc. The digital signals can be used as fault or running signals.

**The modules get the number 17-24.** Address settings by the 8 DIP switches

**Every connection module** has following out and inputs:

- > 2 analog inputs for analog sensors with 4-20 mA Signal
  - > 3 digital inputs for fault or running signal of external equipment
  - > 1 analog output 4-20 mA over the range of the connected net pressure transducer
  - > 2 digital outputs (C-NO-NC 230VAC 2A) for signal output of connected Analog sensors (alarm set points)
- Possible sensors for analog inputs:**
- > Dewpoint
  - > Temperature
  - > Extra pressure
  - > Flow
  - > Current measurement
  - > Energy measurement
  - > Vibration for bearings

### Analog output at the connection module

It is the actual pressure signal from the AIRLEADER as long as the average output is in No (N) position. (See page 6)

**Note:** If average value output is programmed to „Y“ it belongs to another connection module for the pressure signal of the control.

### The digital inputs S - M - B

Can be selected as:

- > **fault signal**—with alarm message
  - > **run signal** for external equipment
- Running hour will be displayed in the Web-Server visualisation

**On all connection modules (up to 8) can be connected –up to**

- > 24 digital messages
- > 16 analog inputs for sensors

## PROGRAMMING REAL TIME CLOCK

**Date / Time**

Date: Day: 14 Month: 07 Year: 2022

Time: Hour: 08 Minute: 47 Sec.: 27

Timezone: GMT+2:00

Set Timezone Save Close

### Set date and time

Touch on each field and set the date and Time of the real time clock.

**5.83 bar ON 22.0 m3/min**

**Clock settings**

SP	Mo	Tu	We	Th	Fr	Sa	Su	Hour	Minute	ON	DP	RF	R1	R2
1								00	00	✓	1	1		
2								00	00	✓	1	1		
3								00	00	✓	1	1		
4								00	00	✓	1	1		
5								00	00	✓	1	1		
6								00	00	✓	1	1		
7								00	00	✓	1	1		

Close Save

0 1 2 3 4 5 6 7 8 9 DEL C

### Example:

#### 1. Monday to Friday from 6:00-22:00h

- > Control system ON
- > Pressure profil 1
- > Rank profil 1
- > Digital output R1 ON for dryer

#### 2. Monday to Friday from 22:00-24:00 h

- > Lower pressure with pressure profil 2 and rank profil 2
- > At the same time switching to a smaller dryer switched by digital output R2

#### 3. At 00:00 h

The compressed air equipment can be switched OFF by the real time clock

**The clock relay** permits following time controlled functions

- > Switchung compressors ON/OFF
- > 4 pressure profiles, > 4 rank profiles,
- > 2 digital outputs for relays to switch ON/OFF additional equipment like (Dryer, ball valves, etc.)

**The dates for the 2nd, 3rd. and 4th** pressure profil and rank profil must be configured in the main menu

### Note down all attitudes

for all program switching functions so that no being missing programming arise.

### Key switch „CLOCK“

The real time clock is only activated if the the key switch is in position „1“

Up to 16 switching points can be programmed in the menu clock

### Key switch „CLOCK“

deactivated the clock relay functions. If the position is in position „0“.

The compressors management is switching the compressors to the

- > 1st pressure profile and
- > 1st rank profile

That is programmed in the basic menu over the data of the 1st pressure and 1st rank profile.

# CLOCK - PROGRAMMING - NOTES

Compressor chanel								
Nr.	1	2	3	4	5	6	7	8
Name								
Nr.	9	10	11	12	13	14	15	16
Name								

Pressure profile = PP			
Nr.	P min	P max	P Alarm
1	bar	bar	bar
2	bar	bar	bar
3	bar	bar	bar
4	bar	bar	bar

Compressor rank profile = RP								
Kompr.	1	2	3	4	5	6	7	8
1.RF								
2.RF								
3.RF								
4.RF								

Clock relay switching times and functions													
SP	Day of the week							Time	LS	PP	RP	R1	R2
1	M	T	M	T	F	S	S						
2	M	T	M	T	F	S	S						
3	M	T	M	T	F	S	S						
4	M	T	M	T	F	S	S						
5	M	T	M	T	F	S	S						
6	M	T	M	T	F	S	S						
7	M	T	M	T	F	S	S						
8	M	T	M	T	F	S	S						
9	M	T	M	T	F	S	S						
10	M	T	M	T	F	S	S						
11	M	T	M	T	F	S	S						
12	M	T	M	T	F	S	S						
13	M	T	M	T	F	S	S						
14	M	T	M	T	F	S	S						
15	M	T	M	T	F	S	S						
16	M	T	M	T	F	S	S						

SP=switching point

LS=Management Leadsystem

digital output =R1

digital output t= R2

## STATUS DATA

5.83 bar

ON

22.0 m3/min

States and system information

Flow

Energy

Current

Temperature

Dewpoint

Pressure

Bear. monitor

Universal

Compressors

Analog modul settings

System information

Close

DP: 1 RP: 1

Monday, August 6, 2018 - 10:31:50

5.83 bar

ON

22.0 m3/min

Compressor 1 Information

S : OFF

M : OFF

B : OFF

Relay 1 : OFF

Relay 2 : OFF

AI1 : 0.00 mA = 0.00

AI2 : 0.00 mA = 0.00

AO : 9.87 mA = 5.86 bar

<<prev.

next>>

Close

DP: 1 RP: 1

Monday, August 6, 2018 - 10:45:31

Touch on Status to see the status of all connected modules and sensors  
Status of compressor modules (MK) No. 1-16

and extra connected modules (AM) No. 17-24

See the status of:

- > relay 1
- > relay 2
- > analog input 1 Ai-1 in mA and selected sensor data
- > analog input 2 Ai-2 in mA and selected sensor data

5.83 bar

ON

22.0 m3/min

Pressure Information

MM AE1 : 9.89 mA = 5.88 bar

MM AE2 : 0.00 mA = 0.00 bar

AM 17 AE1 : 0.00 mA = 0.00 bar

AM 18 AE2 : 0.00 mA = 0.00 bar

Condition of the sensor values

By selecting the sensor function, all sensor values connected to the controller are displayed by category. The connection location is also displayed.

e.g.

- MM AE1 analog input on the master
- AM 17 AE1 stands for  
Analog module 17  
Analog input 1 AE1 sensor data



## IP-address, Network and factory settings

**Network settings**

IP Address: 192.168.0.145

Net mask: 255.255.255.0

Gateway: 192.168.0.239

Wifi IP: 192.168.4.1

### IP-address settings:

Touch: > Program > Network

- > set IP-address
- > set Subnet Mask
- > set Standart Gateway

**COM Server Settings**

UDP Port: 3001

response time: 300 ms

For multicast/broadcast use the following ip: 192.168.0.255

ClientIP 1: 192.168.0.142 ClientIP 6:

ClientIP 2: ClientIP 7:

ClientIP 3: ClientIP 8:

ClientIP 4: ClientIP 9:

ClientIP 5: ClientIP10:

Modules

Save

Close

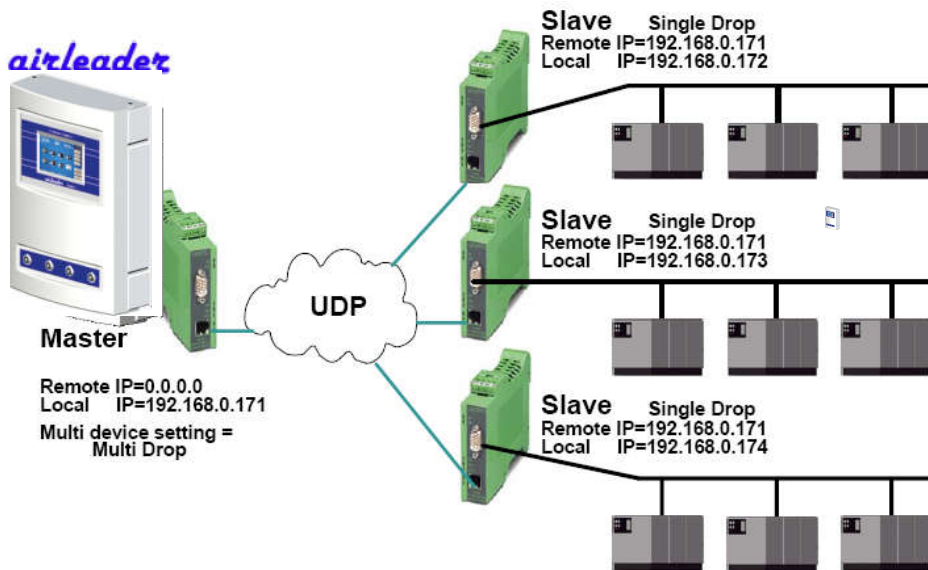
COM Server restart

### Integrated Airleader COM server

can control up to 10 compressor stations via COM-Server.

If compressor modules are connected via COM server the COM servers each receive a separate IP address.

The communication speed needs to be adjusted –see Global settings



### Communication via Ethernet

The connection between AIRLEADER and the connection modules for compressors and other components can be done via the Ethernet by using the COM server.

The RS-485 interface AIRLEADER is connected to a COM server. The COM server gets an IP address that matches the IP address range. More COM-server can be connected to the Ethernet with different IP addresses.

**Global settings**

RBmax delay time: 180 Sec.

RP delay time: 120 Sec.

Pressure hyst.: 0.20 bar

Consum hyst.: 10 %

Comp. change time: 15 Sec.

RS485 response time: 190 mSec.

Access code: Login R1 R2

SZ OFF: 0.50 bar

P delta: 0.30 bar

PAlarm delta: 0.50 bar

V-Gradient: 6

send 0x00 bus pause

Save

Close

Program waiting time for slave response

Touch: >Settings >Global

RS485 response time set to "190 ms"

Changeable If necessary also from 100-300 ms



## Alarm messages, Data manager, Diagram

Alert messages current	
Date	Message
14.07.2022 - 07:32:41	* Compressor 1 AE2 Temperature Alert * Compressor 2 AE2 Temperature Alert * Compressor 5 AE2 Temperature Alert
13.07.2022 - 16:06:08	* Compressor 1 Fault * Compressor 2 Fault * Compressor 3 Fault * Compressor 4 Fault * Compressor 5 Fault * Compressor 6 Fault
13.07.2022 - 15:37:39	* Compressor 1 Fault * Compressor 2 Fault * Compressor 3 Fault * Compressor 4 Fault * Compressor 5 Fault * Compressor 6 Fault



### Alarm messages

Are saved and can be called up via the symbol



Alarm messages can be deleted with the button „CLEAR“

### Data manager

No pendrive. Close window, insert pendrive and reopen!

Data

- Data from 2022/03
- Data from 2022/04
- Data from 2022/05
- Data from 2022/06
- Data from 2022/07

Download

Format SD card

Repair SD-card

Config upload

Close

### Data manager

With this function, the values generated in the controller for displaying the diagrams can be downloaded to a USB-stick to get this into the web server  
**The data is stored monthly**

- > **Format SD card** > **Repair SD card**
- > **Config Upload** - to save already programmed settings from other Airleader controls  
For example when changing control board

### Utility

Serial No.: 3203-00010968

Code Input:

☒ Screensaver

Deactivate HTTP service

Programm Update

Install Add-On

Calibrate touchscreen

Restart

Restart OPC UA

Disable cable break auditing

Save code

Monitoring

Disable WLAN

Close

### Utility:

#### > Deactivate http service

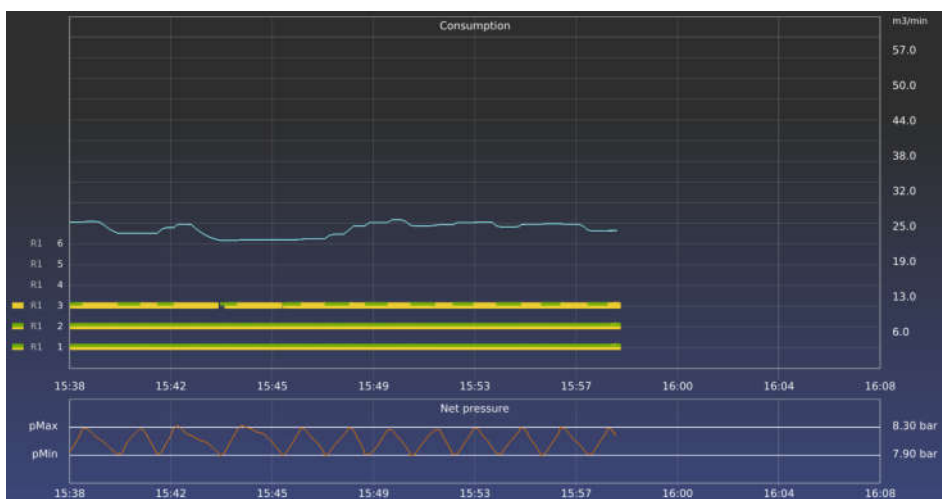
Blocks access to Airleader by computer via the integrated web interface

#### > Program update

With this function, a current program version can be imported via USB-Stick

#### > Install addons

Import program extensions



**Chart function on the display**  
- over the last 30 minutes.

### Shows the condition

#### > of the compressors

load=green, idle=yellow

#### > Compressed air consumption

#### > current pressure

Activation via this icon



# COMMISSIONING and SWITCHING FUNCTIONS

## Connecting -Modules

for compressors has to be mounted on a DIN-rail in the electrical housing in of the compressor

The pressure switches of the compressors now become „safety pressure switches“. Example:

Pressure setting of AIRLEADER	=	7,0-8,0 bar // USA 100 - 110 psi
Setting of compressor pressure switched	=	7,5-8,0 bar // USA 105 - 115 psi

In case of absence of current, the contact's of the connecting module are closed.

The compressors are controlled by their installed pressure switches

Check the pressure connection of the pressure transducer

## ATTENTION:

It is absolutely necessary to install the transducer at a calm part of the compressed air line.

As an optimum we recommend a separate 1/2" line leading from the receiver to the transducer.

Switching ON delay time is 30 sec (default by manufacturer).

## Key switch "START" to position "1"

AIRLEADER will start your compressed air station. From now on your compressors are energy saving controlled, depending on the real consumption of compressed air.

## Programming the various capacity of the various speed compressor

it is absolutely necessary, to program the minimal and maximum capacity of the regulated compressor (according to the manufacturer's indications) together with the mA values appropriately correctly.

Example: minimum capacity = 2,3 m³/min // USA 88 cfm = 6,2 mA measured

maximum capacity = 17,0 m³/min // USA 565 cfm = 17,2 mA measured

[\(See the actual mA Value in Display –press >Status >System >compressors\)](#)

Please see the programming instructions

## 12. Function description for the 4 key switches

### Key switch: START

With this key switch the compressors will be switched ON / OFF.

Position "1" = The compressors will be controlled by AIRLEADER

Position "0" = The compressors turn OFF

### Key switch: CLOCK:

If this key switch is in position "1", the CLOCK will be activated. If this bridge is in position "0" the compressor management is switching the compressors now over the 1st pressure and 1st rank profile. This is programmed in the basic menu.

### Key switch: MAN:

If this key switch is in position "1", the compressors will be switched back to their own controller and will be controlled over the pressure setting of the compressor controller.

### Key switch: PROG

If this key switch is in position "1", all program parts can be programmed.

To program the compressor capacities the key switch must be in position "0".

**Take care that the manual switch is in position "1", - to run the compressor in manual mode.**