

The Atlas Copco logo is displayed in white text on a blue rectangular background in the top right corner of the image.A large, semi-transparent blue graphic in the bottom left corner contains a technical drawing of a compressor. The drawing shows various components and dimensions, including labels like '12.001.0001', '6-PH COPC', 'C-C(1:3)', and several diameters and lengths such as 'Ø72', 'Ø72.8', 'Ø72', '10.8', '18.5', '30.0', '4.8', and '10.5'.

# Central controller

Optimizer 4.0



## ***It's all about efficiency, reliability and connectivity***

Optimizer 4.0, the name says it all... This new device optimizes the operation of your compressed air and blower system while set pressure and flow are being met. It maximizes energy savings and keeps the units in good running condition with a proactive approach to maintenance through online monitoring. The central controller is ready for Industry 4.0, or the Internet of Things, and is designed for smart factories.

## Efficiency

The Optimizer 4.0 complements the already efficient Atlas Copco compressors and blowers. Multiple units installation run with optimum pressure or flow band while prioritizing machines that will have more efficient combination. Realize the full energy saving potential of VSD (Variable Speed Drive) units. This central controller regulates the VSD to cope with varying demand, while avoiding fixed speed machines to run unload whenever possible.

## Reliability and uptime

Aside from efficiency, our customers also demand reliable solutions with the highest availability. When you combine multiple units with the Optimizer 4.0, the load will be distributed evenly among your compressors and blowers, hence equalizing their running hours. Therefore, planning and operation of the preventive maintenance can be done accordingly.

Compressors and blowers operating with Atlas Copco's central controller will have less load/unload cycles and will operate at the lowest possible pressure/flow to extend the lifetime of your machines.

## Connectivity

Management of facilities nowadays always involve remote monitoring and control. In the 4<sup>th</sup> Industrial Revolution (Industry 4.0), machines should be able to send information which can be analyzed by the system and the people who manage the units. This is only possible if your machines are connected. The Optimizer 4.0 is the solution to connect your compressors, blowers and dryers to be monitored and analyzed through Local Area Network (LAN) or via a cloud-based monitoring system. There are various ways to be connected and to monitor the performance of your air system.

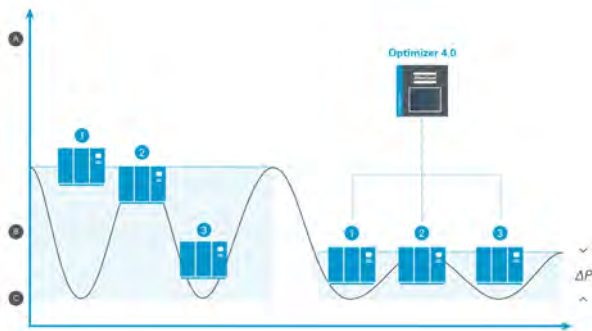


# Energy saver and maintenance planner

With the embedded algorithm, your compressed air and blower system runs at optimal conditions, while reliability is further improved because of well-managed maintenance.

## 1. Setpoint control

Applications controlled by a pressure or flow setpoint can easily be integrated in the Optimizer 4.0. As multiple machines and airnets can be connected, the Optimizer 4.0 is also capable to regulate based on pressure and flow simultaneously.



### Pressure setpoint

Having a central controller reduces the average pressure band.

It also reduces the operating pressure of your machines.

- By reducing the pressure by 1 bar (or 14.5 psi), your energy usage lowers by 7%.
- By reducing the pressure by 1 bar (or 14.5 psi) decreases air leakages by 13%.

Multiple embedded functions in the Optimizer 4.0 in which pressure, capacity and speed can be regulated.

#### Legend

**A** = Net pressure

**B** = Average pressure

**C** = Min. system pressure

## Flow control

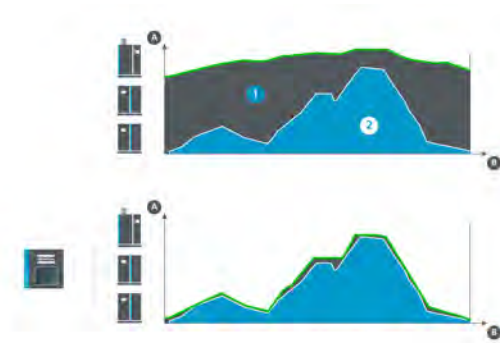
The Optimizer 4.0 efficiently controls up to three air flows

- With or without a flow meter an accurate regulation is obtained.

Easy implementation for each application:

- One flow signal to the Optimizer 4.0.
- Embedded flow bands ensure that the flow is always within the demand, reducing the energy cost related to excess air flow.
- Minimizing the fluctuation of the air flow during a change in demand.
- Reduced pressure results in energy savings.

Multiple embedded functions in the Optimizer 4.0 in which flow, capacity and speed can be regulated.



### Legend

**A** = Energy consumption

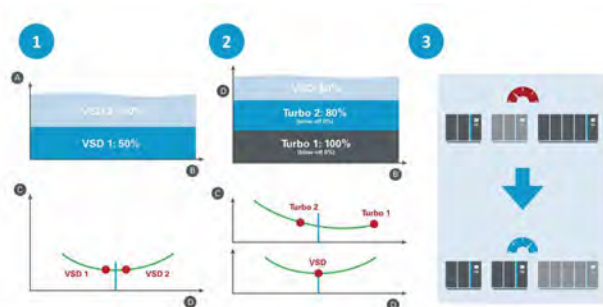
**B** = Air demand

**1** = Energy loss

**2** = Air demand

## 2. Control modes

The Optimizer 4.0 is equipped with multiple control modes that adapt to your compressed air & flow demands. Different control modes can also be applied to different group of compressors & blowers within a profile. Hence, there is group management.



### Energy saving mode

#### 1. Multiple VSD's

Running units will be at most optimum point.

#### 2. Turbos combined with VSD

Centrifugal Turbos will work with VSD in harmony avoiding blow-off (load-sharing can also be applied).

#### 3. Global optimization

Demand profile can vary depending on time of the day or week, Optimizer 4.0 selects the most efficient combination of available machines

### Legend

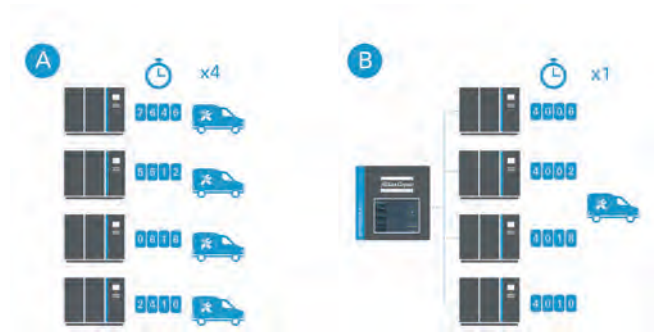
**A** = Flow (l/s)

**B** = Time

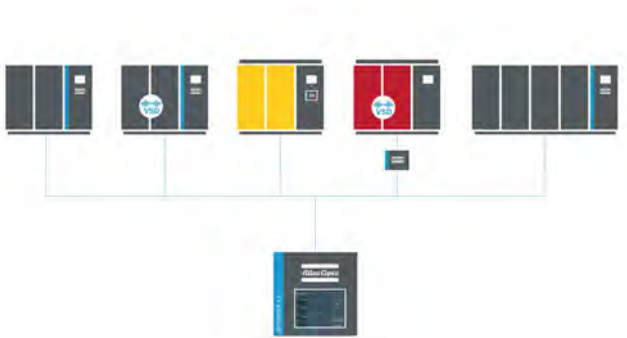
**C** = SER (J/l)

## Equal wear mode

- Equalizes the running hours of the machines by giving them the same priority which can be modified based on unit of time preferred.
- Reduces maintenance interventions to one single visit for all your machines
- Planning & administration are more manageable



## 3. There is even more...



## Optimize your entire compressed air system

Maximizing energy-saving potential even with non-Atlas Copco machines, made possible by an Interface Module for fixed screw compressor and Interface Box for variable speed drive and turbo compressors.

## Supports the working principle of Energy Management System

ISO50001 is a systematic approach on how to achieve continual improvement on energy usage by establishing the baseline, monitoring it and create another opportunity to improve the energy performance.

The features of the Optimizer 4.0 supports this Energy Management System with its ability to determine the base, reduce energy consumption and continuously monitor the performance of the compressed air & blower system, which can also be gathered and able to generate report.

### Legend

1. Define & Plan
2. Implement
3. Monitor & Continuous Improvement



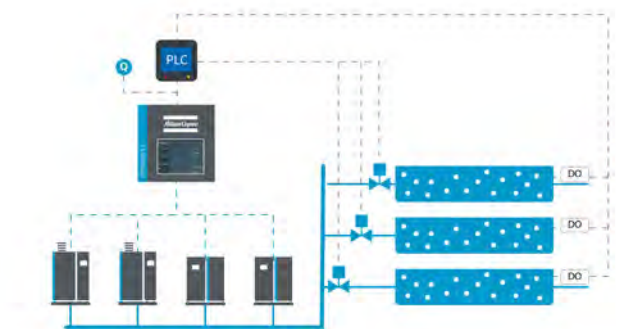
# Reliability in your applications

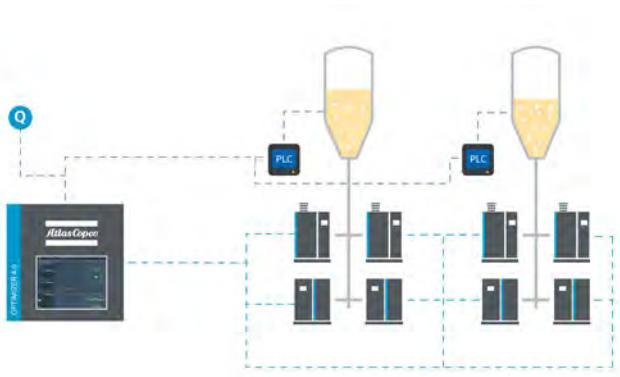
Thanks to the smart design, the Optimizer 4.0 will not only contribute to a longer lifetime of the machines, but also to a stable and reliable application with high uptime. The Optimizer 4.0 is especially designed to save energy in low-pressure and medium-pressure applications.

## Wastewater treatment

The air demand in WWT is changing over-time, resulting in a higher risk of energy losses due to slower PLC interaction.

- Flexibility: Simple integration of new blowers
- One single flow demand calculated by the WWT PLC system, no need for multiple calculations and complex tuning
- Flow split based on the energy efficiency of the blower, the blowers are running at their most optimum point
- Increased process and blower reliability, it's not your local PLC system's responsibility anymore. The Optimizer 4.0 takes care of the uptime!
- Improved TCO: Reduced maintenance cost of the blowers and more energy savings
- Reduced pressure, resulting in savings





## Fermentation

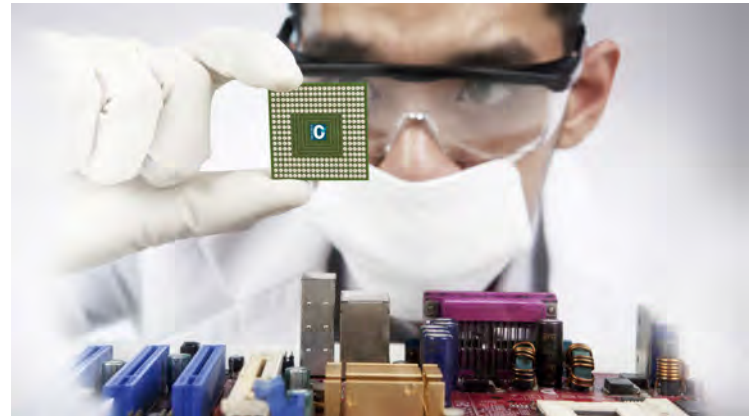
In the food and beverage industry multiple blowers are used to aerate different fermentation processes. Fermenters require very accurate flow control to ensure the correct chemical reaction.

- The Optimizer 4.0 has all the operating data of the screw and turbo blowers, ensuring that the blowers are running at the highest efficiency for each requested flow
- Improved TCO: Reduced maintenance cost of the blowers and more energy savings
- Accurate air flow regulation thanks to the knowledge of the blower's behavior
- Reduced pressure, resulting in savings
- Flexibility: Easy integration of new blowers
- Increased process and blower reliability, it's not your local PLC system's responsibility anymore. The Optimizer 4.0 takes care of the uptime!

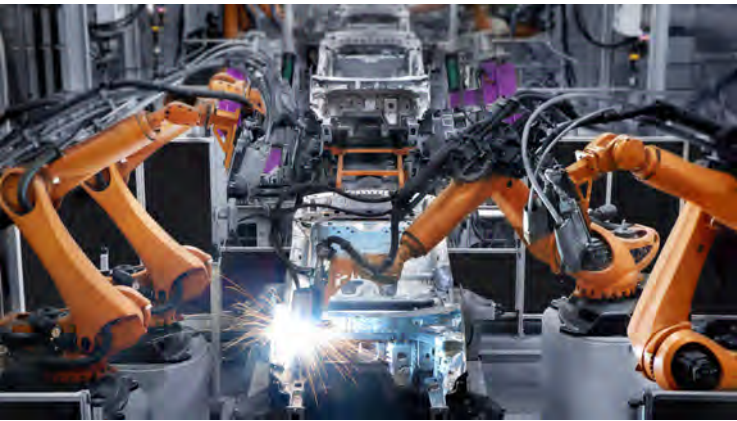
## Electronics

One of the most critical facilities in the Electronics industry is compressed air. Loss of compressed air or huge dip in set pressure can lead to costly production loss. Hence most electronics companies have an integrated monitoring system that can provide data analysis and an easy to trace parameters' history.

- With Optimizer 4.0, you can easily gather information from the whole compressed air system through the Optimizer 4.0.
- It can serve as communication gateway depending on customers required protocol
- Electronics application requires huge compressed dry air. Hence they need more energy to produce compressed and dry air, a central controller with smart control algorithm can lower down the power consumption.







## Automotive

Due to huge application of compressed air in various processes such as Engine & Vehicle Assembly, Stamping, Painting Process, and other pneumatic tools application, Automotive Factories usually have multiple turbo units and several VSD compressors.

- Optimizer 4.0 can manage the whole compressed air system and adapt to the demand of automotive assembly process.
- It can store and generate report able to help plant managers plan their next steps to align their factories compressed air requirement.
- The central controller also help in planning their maintenance with utilization information & machine data trend, leading to a more reliable system.

## Food & beverage

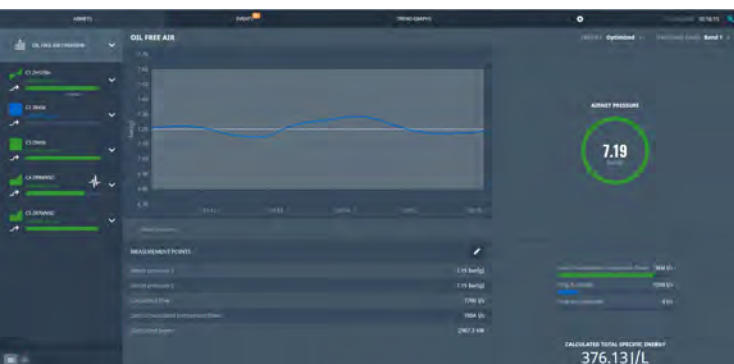
The food & Beverage industry has one of the most stringent quality air requirements. They consume a lot of compressed air for their different applications in their process, packaging, conveying and clean-in-process.

- Having an Optimizer 4.0 also helps to monitor all critical parameters like dew-point, compressed air temperature and other measurement points that can be integrated and be monitored in the user interface via Analog inputs.
- The compressed air profile in Food & Beverage usually varies depending on the products produced and time of the day, with multiple compressor and VSD units, Optimizer 4,0 will select the most efficient combination adapting to the factory's demand.



# Monitoring & control

The new user interface provides a better overview of your entire compressed air system in terms of power consumption and air demand. Individual machine parameters can be viewed for faster reaction time and maintenance planning.



## AIRnet/Process

This section serves as the main screen of the Optimizer 4.0. It provides the overview of the whole system's status and shows key parameters.

### Set Pressure or Flow

System pressure or flow in a glance  
Evolution of actual pressure or flow in a given time frame.

### Calculated Flow

Indicates utilized capacity & how much is still available. In case a machine is not able to operate, the equivalent capacity in "red" bar will be shown to indicate action is required.

### Integrated Machines

Overview of all connected machines & their status (loaded, unloaded, % capacity & IGV positions). All connected units' parameters are shown (pressure, calculated flow, power, speed, and other measurement points). Possible to integrate and isolate machines.

### Pinned Value

Aside from Pressure & Flow, other critical parameters can be shown in the main screen as "Pinned Value". It can be any parameter in the system that is already available in the Optimizer or any digital input from customer's measurement point (actual flow, dew-point, ambient temperature).

## Events

### Notifications

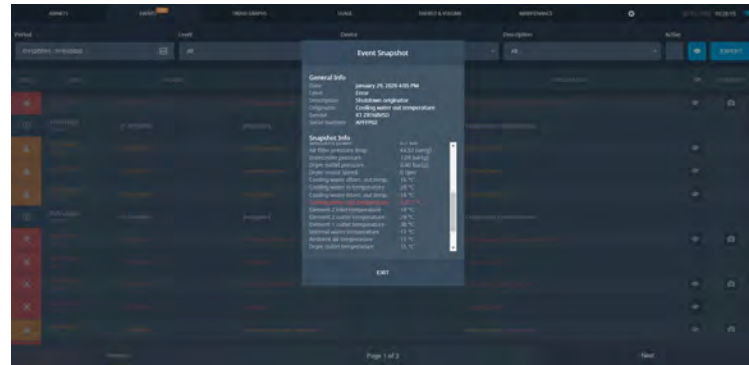
Notification signs on the “Events” tab to inform the end-user.

Description of machine’s cause of alarm (e.g. service required, warning, shutdown).

Specific cause of the alarm in the Event Snapshot.

### History

Trace back the occurred events (level & type of machines) based on the selected period.



## Trends

### Key Parameters

Overview of an Airnet / process pressure & flow in a graph

Create your own trend graph based on selected parameters & time period.

### Energy Data

Monitor power consumption trend of an Airnet/ process or an individual machine

Analyze how efficient the system with an Specific Energy Requirement trend (power vs. flow) & compare it with the factory’s production output.



# Connectivity

With your equipment ready for Internet of Things (IoT), units in the compressed air & blower system can gather and send data to the facilities management for faster analysis to initiate energy-savings program and adapt to the current demand of the production. Planning for preventive maintenance is more convenient and companies will have a faster reaction that corresponds to utilization of compressors & blowers. This is possible with Optimizer 4.0 with its CONNECTIVITY features.



## REMOTEVIEW

Monitoring & controlling is no longer confined inside the compressor room. REMOTEVIEW mirrors the Optimizer 4.0 user-interface to any monitoring device through a Local Area Network (LAN). Remote control of the Optimizer 4.0 itself is also possible. You are able to change pressure/flow setpoint, integrate & isolate units and select the optimization profile that can done with sufficient access rights.

## SMARTVIEW

Get rid of high cost of system monitoring integration and have your own Atlas Copco-designed local visualization screen for machine parameters, compressed air & flow demand, power consumption and other notifications that can be viewed remotely via Local Area Network.

### Energy & Volume

Capture specific energy requirement and compare it in a specified period. Generating report is made easy whether with an Excel file or PDF format.

### Usage

How are the machines' performance in terms of utilization?

The "Usage" section provides information on how much individual machines are utilized. You can manage the maintenance planning of the entire system. The data can be used to justify additional compressors or blowers.

This is all available in an optional SMARTVIEW feature.



## SMARTLINK

Get insights and access to compressed air & blower equipment, anytime of the day or anywhere you are through Atlas Copco's cloud-based monitoring system, SMARTLINK. A customized report on energy efficiency is always ready to be downloaded. Early warning notifications to replace maintenance parts on time and avoid unnecessary breakdown and production loss. Aside from the customer's access, SMARTLINK is monitored in key strategic areas around the globe by a dedicated Atlas Copco specialists.

## SMART2SCADA

The Optimizer 4.0 is a communication gateway. Depending on the communication protocol, Modbus TCP, Ethernet IP or OPC-UA, compressors and blowers data can be communicated to the facility site's SCADA system. SMART2SCADA is an optional software upgrade and no extra hardware is needed.



*smart AIR solutions*





## 1. Central controller

Optimizer 4.0 can further increase the efficiency of the operation of the whole system by operating the integrated machines in their most optimum points possible. Dryer parameters can also be monitored. Key machine parameters and data trends can be generated and have an easily downloaded via Smartview options. Optimizer 4.0 can also be the data uploader to Atlas Copco's Smartlink. This central controller also serves as a gateway to customer's Scada / DCS system depending on the communication protocol.

## 2. Elektronikon Mk5 Touch

With the Atlas Copco local controller, it can easily be connected to the Optimizer 4.0 central controller. Performance curve of each model is known to Optimizer 4.0, enabling it to operate integrated machines as efficient as possible with energy saving mode, having a balanced running hours with equal wear mode, or prioritizing units to run with forced sequence. Aside from overview of the whole system, individual unit's parameters can also be viewed. These collected data from the Elektronikon are converted into graphical representation of a selected measurement or parameter.

## 3. Integrated Smartlink

Aside from the new touch and feel, Atlas Copco's Elektronikon has also built-in Smartbox. Being connected, provides you an overview of the compressed air usage, status of all machines and plan the preventive maintenance of all equipment. Smartlink connectivity also provides assistance from Atlas Copco on managing the whole compressed air or blower system.

## 4. Air Dryer

On the Optimizer 4.0, Air Dryer performance can be monitored, the status and the real-time dew-point measurement reading. If the pressure dewpoint or quality of air is critical to the customer's operations, it can be the "pinned value" that can also be shown on the main screen.

## 5. Air Receiver

Provides buffer and pressure & flow stability. It is also recommended to place the pressure transmitter in the pressure vessel to avoid pressure pulsations. The correct size of buffer, also provides enough time cushion for the Optimizer to make decisions.

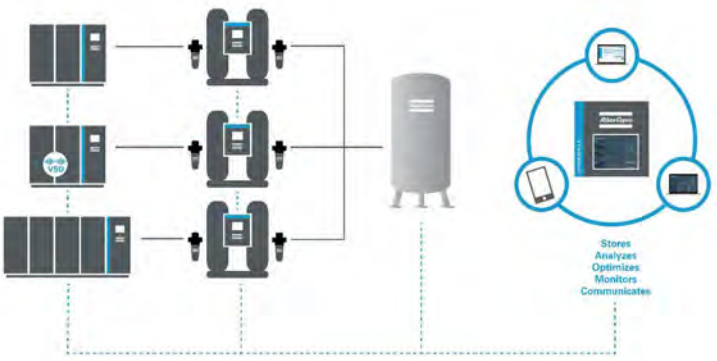
## 6. Air Filter

Another component to comply to the quality air requirements is the air filter. But in due time, these filters can also need maintenance to avoid any contamination or contribute to huge pressure drop if clogged. Pressure differential signals can also be monitored in the Optimizer screen through 4-20mA analog inputs.

## 7. AIRnet

Pipe installation is one of the most critical component in the compressed air system. For energy efficiency, it should be properly sized to avoid big pressure drop and ideally free from leakages. For critical applications, pipe should be clean and free from corrosion. Pressure sensors & flow meters can be installed in the distribution pipe and monitor it in the Optimizer 4.0 through 4-20mA digital input. Atlas Copco's unique Airnet pipes is ideal for general and critical applications, part of our smart AIR solution.





— **smart AIR solutions**

Only a complete solution is an energy efficient system. smart AIR solutions combine compressors, blowers and boosters with quality air solutions fully optimized to operate together in the most efficient and reliable way. Our smart AIR solutions apply for all our customers and include not only the products but also our services.



# Technical specifications

## Operational capabilities

| Operational capabilities               |  |
|--|--|
| Maximum number of connected machines   | 60   |
| Maximum Load-unload, VSD & Turbo units | 30   |
| Dryers (monitoring)                    | 30   |
| Set-point control                      | Pressure/Flow                                |
| Maximum of airnets / processes         | 3*   |
| Control modes**                        | Energy Saving / Equal Wear / Forced Sequence |

\* For compressor applications, multiple airnets are available through Optimization Plan.

\*\* Can implement within groups or between groups.

## Connectivity

| Connectivity                 |   |
|------------------------------|---|
| Standard analog Inputs*      | 8   |
| Standard digital input*      | 4   |
| Standard digital output*     | 4   |
| Data logging                 | Minimum 30 days of measured or calculated data. Minimum 2 years for energy data               |
| Local / Remote Connectivity  | Embedded webserver view of user interface on any device in LAN via REMOTEVIEW (standard)      |
|                              | Remote monitoring, data gathering, generating printable trend graphs via SMARTVIEW (optional) |
|                              | Online cloud-based monitoring via SMARTLINK (optional)  |
| Remote Commands via Fieldbus | Modbus TCP / Ethernet IP via Optional SMART2SCADA software (no extra hardware needed)         |
|                              | Modbus RTU / Profibus via optional Mk5 Gateway  |

\* Can be expanded

## Hardware

| Hardware                 |                                 |
|--------------------------|---------------------------------|
| Display size             | 12"                             |
| Screen                   | Capacitive touch                |
| Amount of ethernet ports | 4                               |
| Cubicle protection       | IP 54                           |
| Dimensions (LxWxH)       | 600x600x210mm or (24x24x8 inch) |
| Weight                   | 32kg (70lbs)                    |



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