PRIMAIR TURBO®

YOUR PROCESS AERATION SOLUTION

✚ **Single-stage compressors** with **170**kW to **350** kW installed shaft power
✚ **Two-stage compressors** with **170**kW to **350**kW installed shaft power

PRIMAIRTURBO GmbH | Lange Minte 15, 27321 Thedinghausen, Germany

PRIMAIR TURBO 2200 HP 350

YOUR PROCESS AERATION SOLUTION

+ A COMBINATION OF UNRIVALLED EFFICIENCY AND PRIME RELIABILITY

Utilising state of the art active magnetic bearings designed for continuous operation 4 km under the sea, the high-speed motor provides a reliability second to none *(exceeds mean time between failure (**MTBF**) rates of 100 000 hours).*

The permanent magnet motor combines high speed and high efficiency to provide a compact drive with a better total efficiency of more than 10% when compared with standard motors.

The combination of a high efficiency variable frequency drive and the above-mentioned motor coupled directly to the impeller, results in an oil free compressor of unrivalled reliability.

The design of high efficiency turbo machinery is a know-how intensive undertaking requiring highly skilled employees as present at *PRIMAIR TURBO*.

PRIMAIRTURBO GmbH | Lange Minte 15, 27321 Thedinghausen, Germany

THE DESIGN PROCESS YIELDS AN OPTIMIZED COMPRESSOR STAGE DESIGN WITH USE OF THE LATEST COMPUTER AIDED SIMULATION TOOLS.

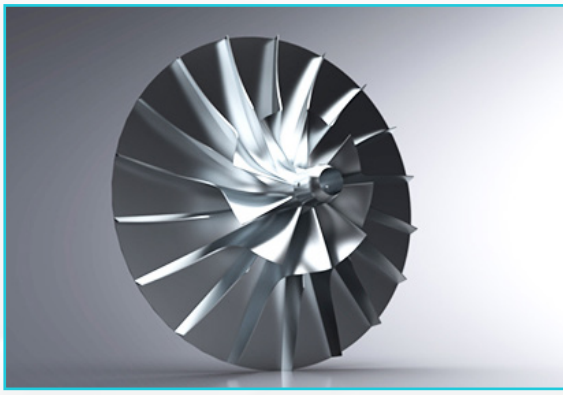
Energy efficiency has become the prime tool in the global effort to reduce carbon emissions, which in turn has been identified as the major cause of climate change.

In most processes that require aeration, it accounts for a major part of the energy consumption.

- **For example, in waste water treatment with activated sludge, aeration constitutes between 40% and 70% of the energy used *(Wef Manual of Practice; No Om-9)*.**
- **Another example is the aeration of fermentation tanks with cycle times between 18hrs and 27hrs with an even higher proportion.**

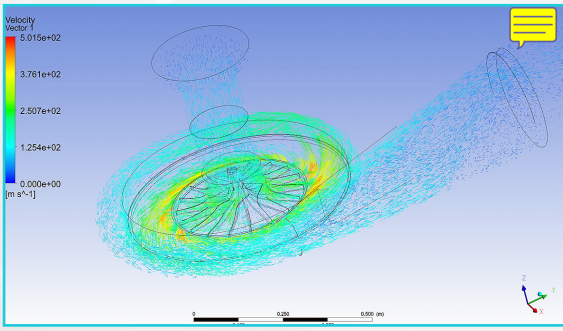
Also, the extensive experience available at ***PRIMAIR TURBO*** has been used to produce intelligent control algorithms to optimize the energy saving potential by utilizing the flexibility inherent in the Turbo Compressor design.

THE *AIR-END:*

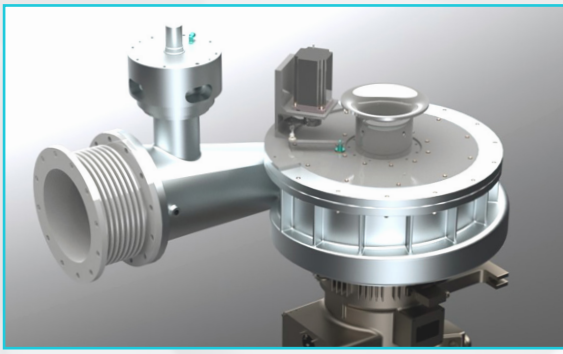


+ A proprietary software is used to design a **highly efficient 3-dimensional radial impeller** with very high efficiency.

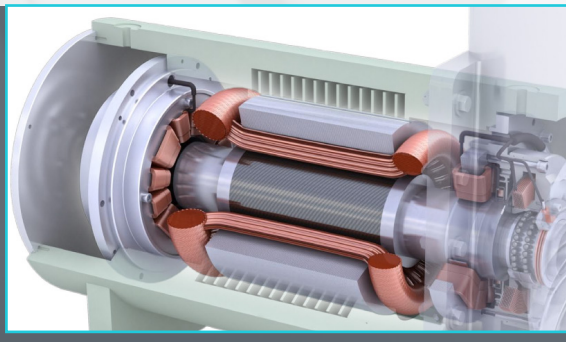
  The complete flow path is **designed to maximize efficiency**.



+ Extensive 3D flow simulation is done **to validate and ensure the performance of the compressor stage** before its manufacture.

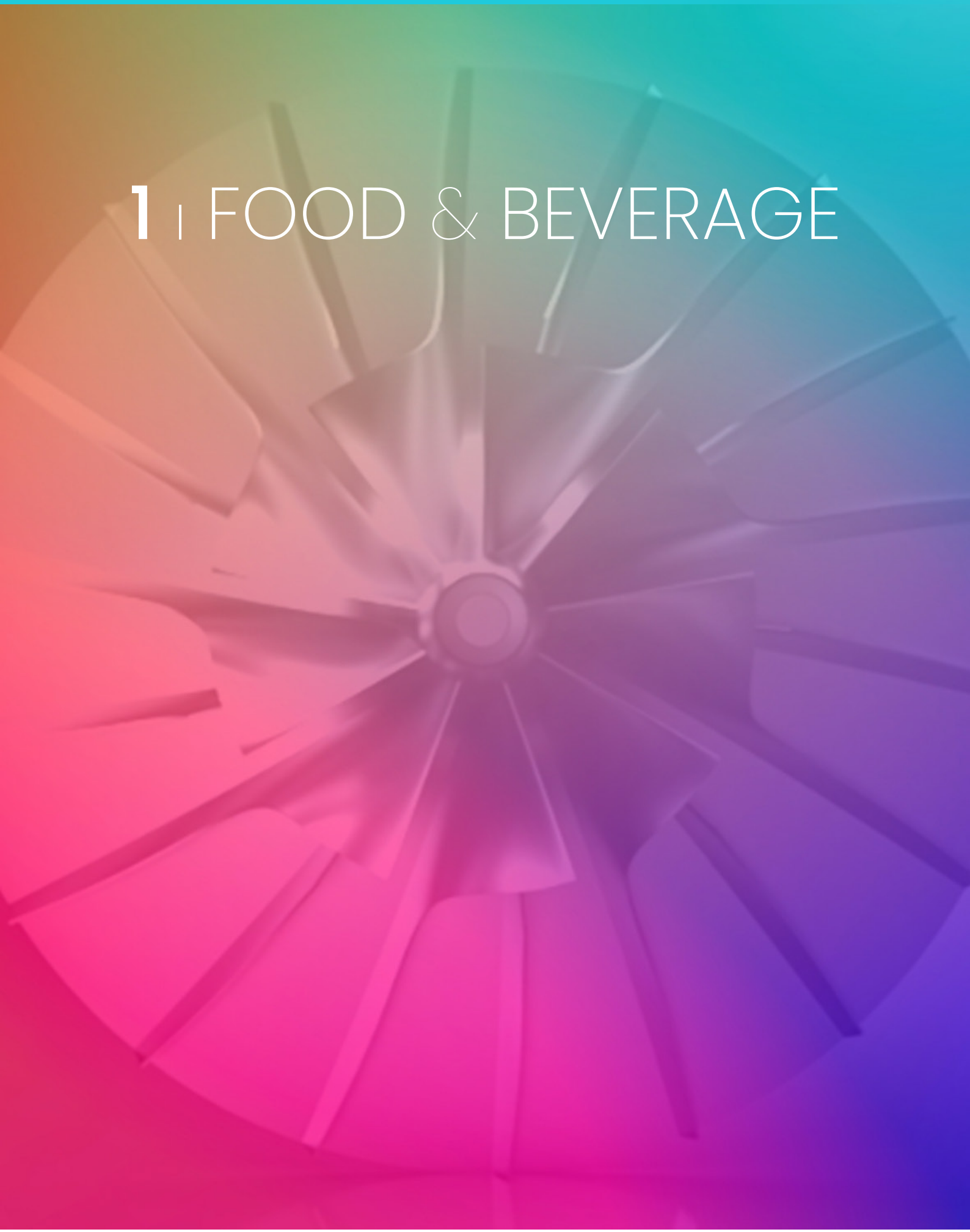


+ The result is a compressor stage that has a **peak polytropic efficiency of 87%** and a broad **operating range with efficiencies above 80%**.



+ To secure the ease of service around the world, an **off the shelf variable frequency drive is used to drive the motor**.

1 | FOOD & BEVERAGE



YOUR APPLICATION:

FOOD & BEVERAGE

We supply a highly efficient air compressor that delivers Oil-free Air 24 hours a day 7 days a week with virtually no maintenance.

CONTROL YOUR PROCESS BY OPERATING THE BLOWER IN:

- **FLOW CONTROL**
- **PRESSURE CONTROL**
- **DISSOLVED OXYGEN CONTROL** OR
- **ANY VARIABLE** OF YOUR CHOOSING.

WE *AERATE* YOUR:

FERMENTATION TANKS

The integrated algorithms detect and protect the compressor from quick closing valves and other system dynamics, thus reducing the integration time.

2 | PHARMACEUTICAL INDUSTRY

YOUR APPLICATION:

PHARMACEUTICAL INDUSTRY

We supply a highly efficient air compressor that delivers Oil-free Air 24 hours a day 7 days a week with virtually no maintenance.

CONTROL YOUR PROCESS BY OPERATING THE BLOWER IN:

- **FLOW CONTROL**
- **PRESSURE CONTROL**
- **DISSOLVED OXYGEN CONTROL** OR
- **ANY VARIABLE** OF YOUR CHOOSING.

WE *AERATE* YOUR:

BIOREACTORS | AEROBIC DIGESTERS

The integrated algorithms detect and protect the compressor from quick closing valves and other system dynamics, thus reducing the integration time.

3 | WASTEWATER TREATMENT

YOUR APPLICATION:

WASTEWATER TREATMENT

We supply a highly efficient air compressor that delivers Oil-free Air 24 hours a day 7 days a week with virtually no maintenance.

CONTROL YOUR PROCESS BY OPERATING THE BLOWER IN:

- **FLOW CONTROL**
- **PRESSURE CONTROL**
- **DISSOLVED OXYGEN CONTROL** OR
- **ANY VARIABLE** OF YOUR CHOOSING.

WE *AERATE* YOUR:

MEMBRANE BIOREACTORS (MBR) | SAND TRAP | EQUALIZATION TANKS | AEROBIC DIGESTERS | SEQUENCING BATCH REACTORS (SBR)

The integrated algorithms detect and protect the compressor from quick closing valves and other system dynamics, thus reducing the integration time.

4 | MINING & MATERIALS

YOUR APPLICATION:

MINING & MATERIALS

We supply a highly efficient air compressor that delivers Oil-free Air 24 hours a day 7 days a week with virtually no maintenance.

CONTROL YOUR PROCESS BY OPERATING THE BLOWER IN:

- **FLOW CONTROL**
- **PRESSURE CONTROL** OR
- **ANY VARIABLE** OF YOUR CHOOSING.

Our highly dynamic system allows a pressure control of exceptional accuracy.

WE *AERATE* YOUR:

FLOATATION TANKS | AIR KNIFES IN Zn COATING | TRANSPORT SYSTEMS IN CEMENT FACTORIES

The integrated algorithms detect and protect the compressor from quick closing valves and other system dynamics, thus reducing the integration time.

5 | POWER GENERATION

YOUR APPLICATION:

POWER GENERATION

We supply a highly efficient air compressor that delivers Oil-free Air 24 hours a day 7 days a week with virtually no maintenance.

CONTROL YOUR PROCESS BY OPERATING THE BLOWER IN:

- **FLOW CONTROL**
- **PRESSURE CONTROL** OR
- **ANY VARIABLE** OF YOUR CHOOSING.

Our highly dynamic system allows a pressure control of exceptional accuracy.

WE *AERATE* YOUR:

FLUE GAS DESULPHURIZATION (FGD) SYSTEMS |
FUEL ATOMISATION SYSTEM

The integrated algorithms detect and protect the compressor from quick closing valves and other system dynamics, thus reducing the integration time.

SERVICE & SUPPORT

+ CONNECTIVITY:

- Each compressor can communicate via Modbus TCP, Ethernet IP or other Modern Fieldbus protocols with the plant SCADA.
- A proprietary sequencer is also available for the control and supervision of multiple compressors in an installation (***PRIMMCU***). This Unit then constitutes the single point of connection to the plant SCADA.
- Depending on the chosen Network architecture, each can be equipped with a router for remote access or the PrimMCU becomes the node for this functionality *(The system is equipped with a hardware switch that permits access only with customer permission)*.
- Servicing or system tuning can thus be done remotely with added cost saving for the customer.

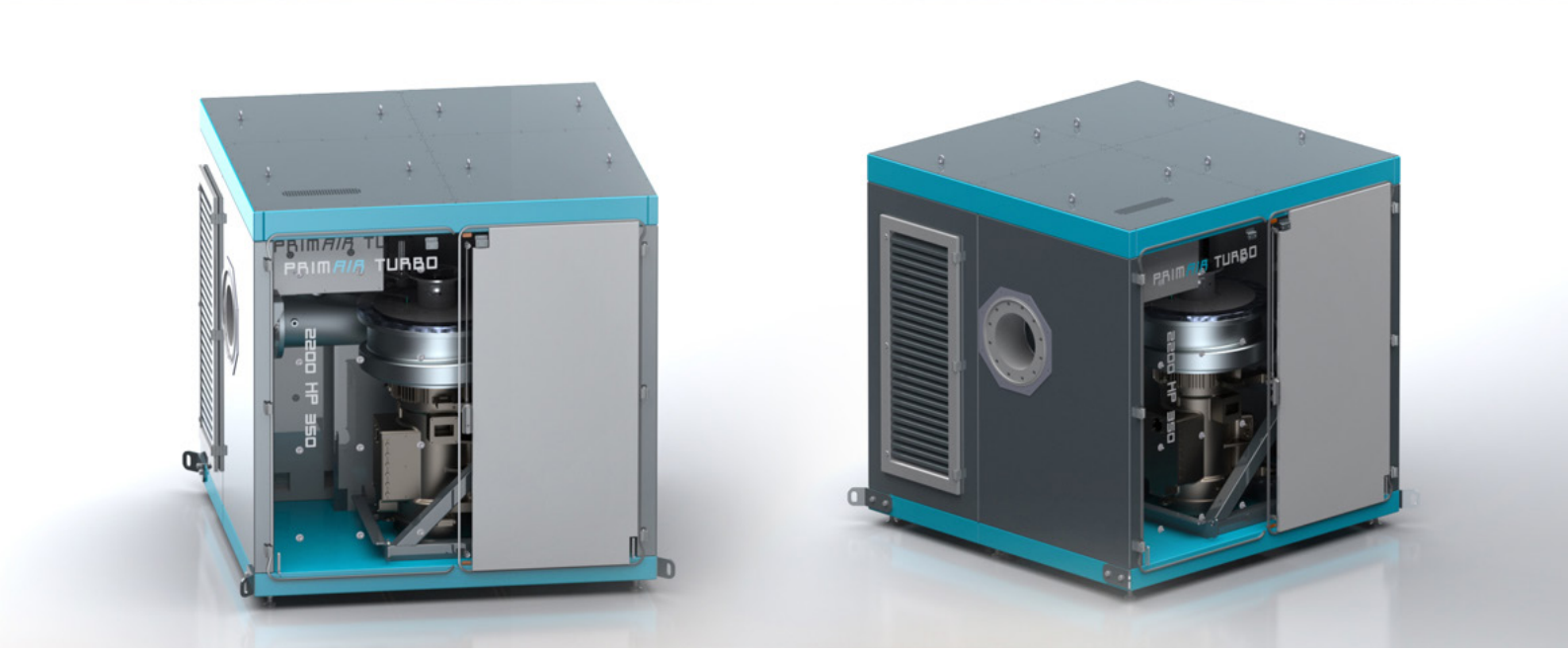
+ SERVICE:

- Installation and commissioning
- Process optimisation using the ***PRIMMCU***
- Periodic maintenance on site
- Compressor upgrade packages to attend to the customers growth
- Training of the customers staff

OUR FEATURES ARE YOUR BENEFITS

- **A variable diffuser geometry ensures** the highest possible efficiency at all loads
- **The Highspeed Permanent Magnet motor** provides high efficiency in nominal and part loads
- **The Turbo compressor package** guarantees increased equipment reliability *(no wearing parts)*
- **Has virtually no need for maintenance –** Only some air filters need to be changed at intervals depending on the local air quality *(Controls prompt when filter change is needed)*
- **Provides users with powerful diagnostics tools** to help set up processes
- **Optimized process control** *(wide and efficient operation range, no start-stop limits)*
- **Provides decreased construction costs** due to a more integrated and compact design
- **Optimized** for low noise emission
- **Meets all applicable regulation requirements**
- **Utilizes a Novel Evaporative cooling system** which guarantees the operation of the compressor in adverse environmental conditions without the need for derating
- **The cooling system can be upgraded** with a heat recovery system
- **In case of Grid failure,** the motor switches into a generator mode and provides power to the magnetic bearings until the shaft slows down to a low speed and rolls to a stop on the ball bearings without any damage to the equipment *(UPS function without Batteries or other external energy supply)*

PRODUCTS



PRODUCTS | LOW PRESSURE

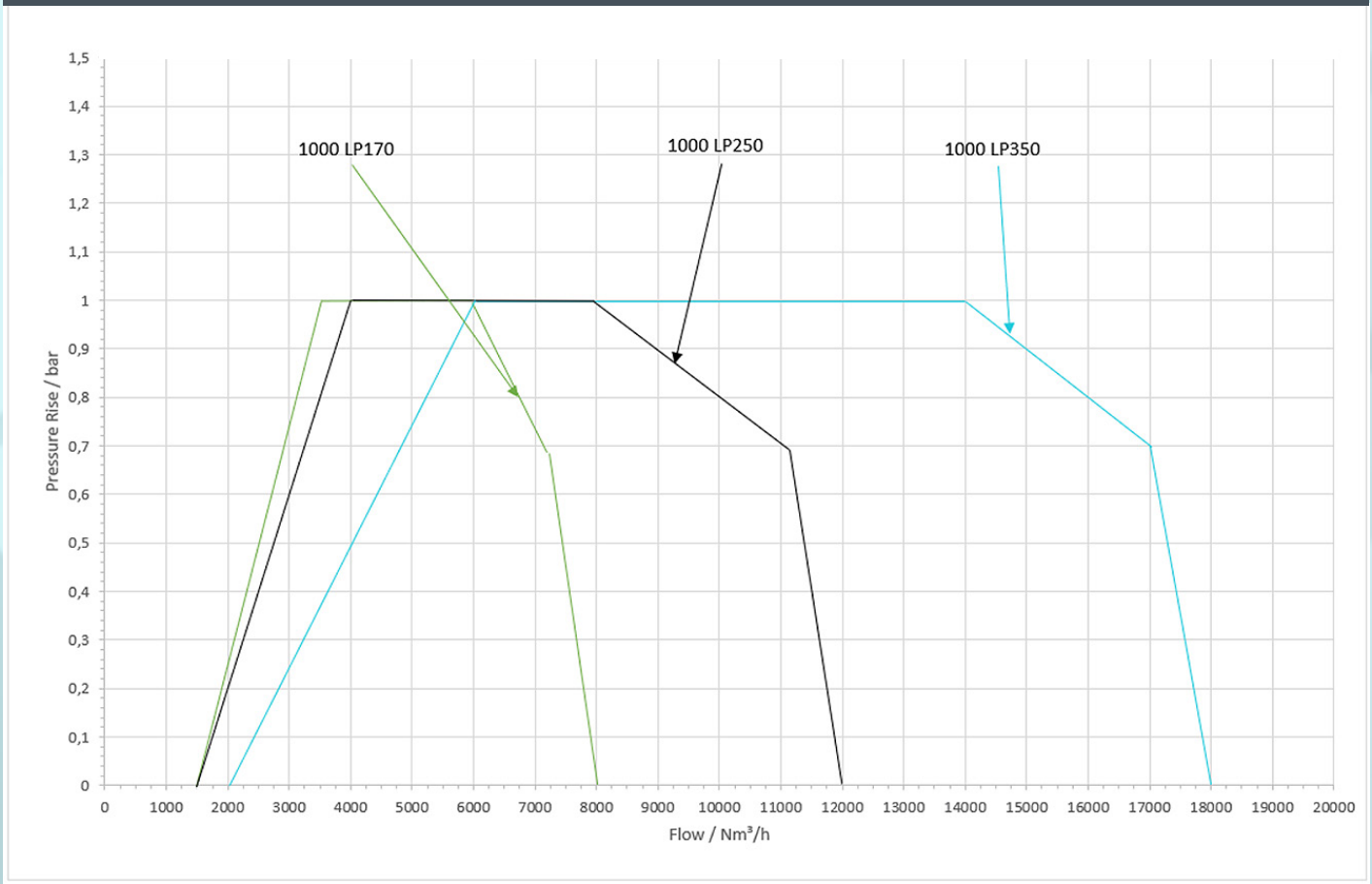
1000 LP 170	
Pressure (bar)	Flow (m³/h)
1.0	3500-6000

1000 LP 250	
Pressure (bar)	Flow (m³/h)
1.0	4000-8000

1000 LP 350	
Pressure (bar)	Flow (m³/h)
1.0	6000-14000

LOW PRESSURE PRODUCT RANGE

Generalised Performance Map | PRIMAIR TURBO® LOW PRESSURE SERIES



PRODUCTS | MEDIUM PRESSURE

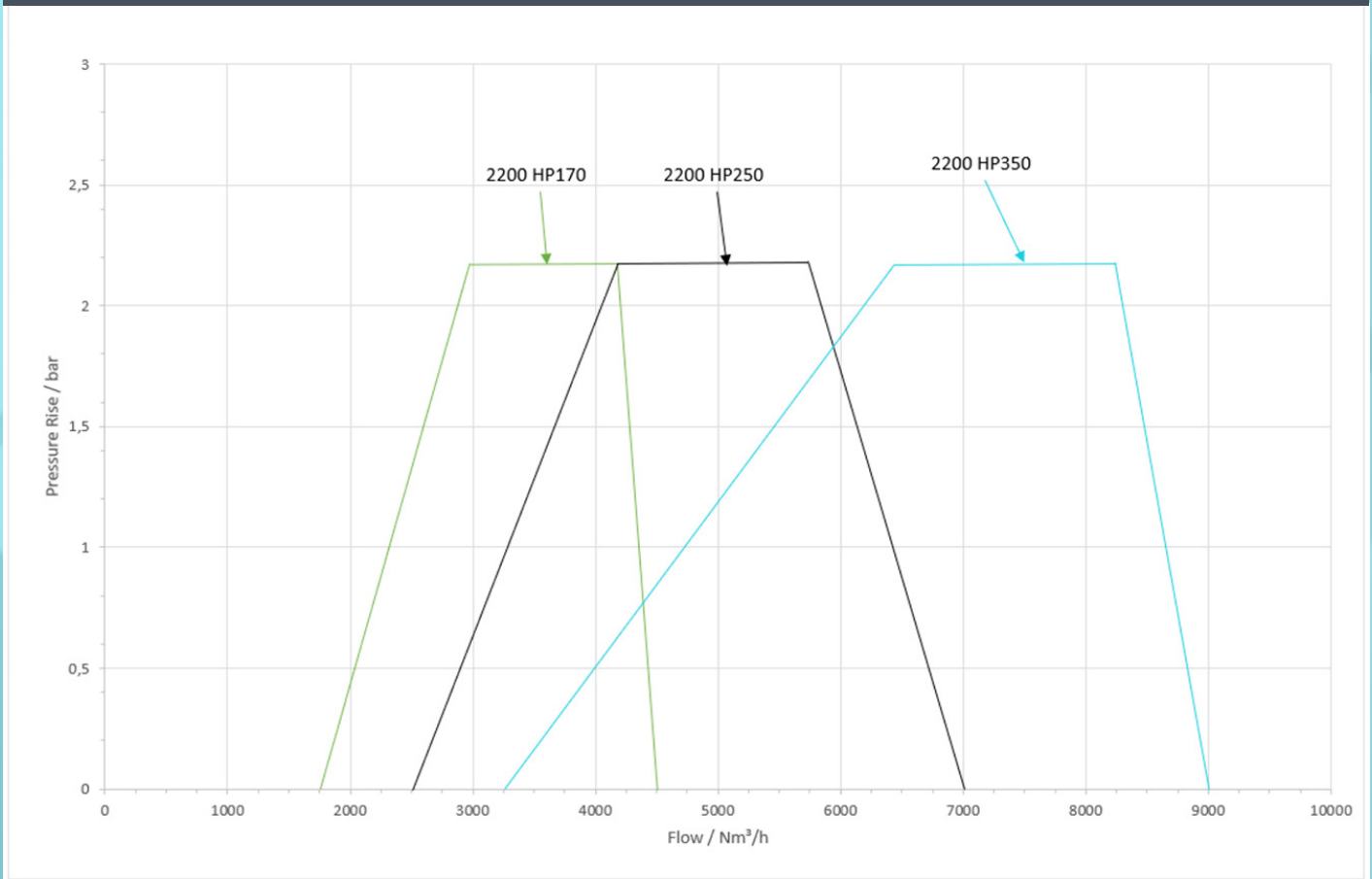
2200 HP 170	
Pressure (bar)	Flow (m³/h)
2.2	3000-4200

2200 HP 250	
Pressure (bar)	Flow (m³/h)
2.2	4200-5700

2200 HP 350	
Pressure (bar)	Flow (m³/h)
2.2	6300-8200

MEDIUM PRESSURE PRODUCT RANGE

Generalised Performance Map | PRIMAIR TURBO® MEDIUM PRESSURE SERIES



PRODUCTS | HIGH PRESSURE

5000 UHP 170	
Pressure (bar)	Flow (m³/h)
4.5	490-2000

5000 UHP 250	
Pressure (bar)	Flow (m³/h)
4.5	1200-3100

5000 UHP 350	
Pressure (bar)	Flow (m³/h)
4.5	2000-4100

HIGH PRESSURE PRODUCT RANGE

Generalised Performance Map | PRIMAIR TURBO® HIGH PRESSURE SERIES