

Tamturbo
JUST AIR

Tamturbo® Compressors

**Touch-Free.
Oil-Free.
Care-Free.**



COMPANY PURPOSE

Tamturbo develops, manufactures and sells industrial turbo compressors



100% Oil-Free



The most sustainable solution in the markets



With the Lowest Total Cost of Ownership



Did you know that

Industrial compressed air consumes

10% of global
industrial
electricity

5% of the total
world
electricity

The growth of industrial automation
increases compressed air use at
5 to 7% annually

Tamturbo Milestones 2010–2019

2010

Tamturbo founded by Mr. Jaakko Säiläkivi & Mr. Kimmo Laine

2011–2012

Pre and Concept Design of High Speed turbo compressor

2013–2014

R&D Projects (bearings, motor, turbo, control system)

2015–2016

Pilot Products, Proving Concept performance, real world on-site testing, Introduction at Hannover Messe

2017

Production Start, Range 60kW (75hp) – 350kW (500hp). First units sold and placed in service.

2018

Product range: 5 compressors from 60 – 185 kW range, several distributors in Europe, America and Asia

2019

Product range: from 60 – 325 kW range, units in Asia, SEA, Middle-East, Europe and America

2024

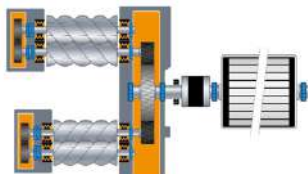
Sales €100 (\$110) Million

Problem and solution



CUSTOMER PAIN: "OIL-FREE" DRY SCREW COMPRESSOR

- 👎 Requires oil
- 👎 Efficiency loss
- 👎 High maintenance



SOLUTION: TAMTURBO 100 % OIL-FREE COMPRESSOR

- 🚫 100% oil free
- 🧲 Magnetic levitation bearing
- 🔧 Maintenance free



Customer Benefits

Quality: Need for 100% oil-free air

Flexibility: Variable air usage

Total Cost of Ownership: Energy efficiency at the core of operations

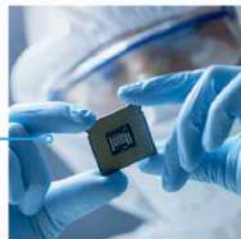
Reliable: Predictable and sensible maintenance

Extra Value: Using hot water to further improve energy efficiency

Food &
Beverage



Electronics



Pharmaceutical
& Medical



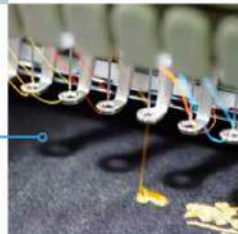
Manufacturing



Automotive



Textile



Pulp &
Paper



CURRENT “OIL-FREE” (SCREW) COMPRESSOR TECHNOLOGY IS 60 YEARS OLD

- Not developed for oil-free air
- Not oil-less technology
- Excessively complex
- High lifetime costs
- Efficiency deteriorates over the life cycle
- High maintenance costs
- Oil, Oil Filters, Oil Demisters, Couplings, Seals, Rotor Coating, Gears, Shaft Seals, etc.

LIST OF SEALS AND BEARINGS

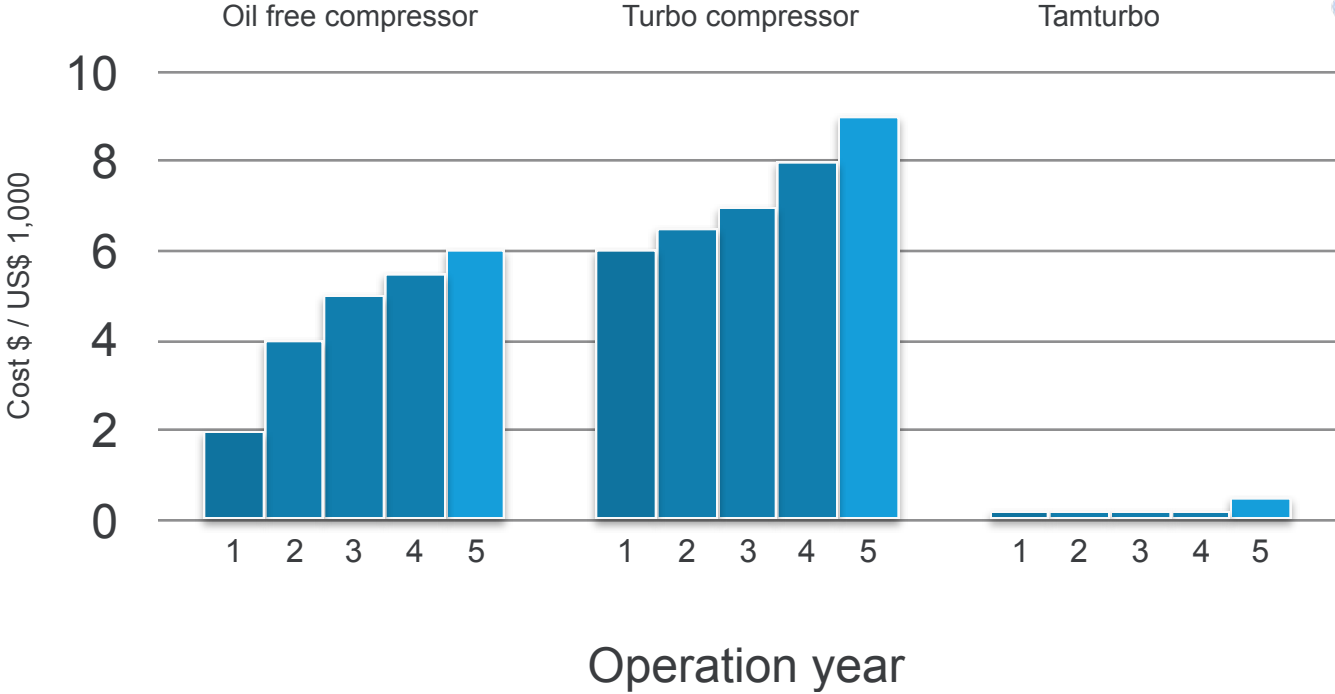
	“Oil-Free” Screw Compressor	Traditional Turbo Compressor	Tamturbo® Touch-Free™ VDS Compressor
Oil Systems	1	1	0
Gears	7	3	0
Oil Seals	9	4	0
Bearings (Mechanical/Journal)	19	7	0

PARTS THAT DON'T TOUCH DON'T WEAR

- The core of the Tamturbo® Touch-Free™ Technology is Active Magnetic Bearings.
 - Rotating parts levitate and are in contact with just air.
- The high-speed electrical motors remove the need for gearboxes and couplings.
 - No extra friction losses and turndown range up to 63%.
- Our ingeniously simple design eliminates virtually everything that can go wrong on an air compressor
 - NO gears, bearings, seals, oil separators, oil pumps, filters and of course, oil



Maintenance cost comparison

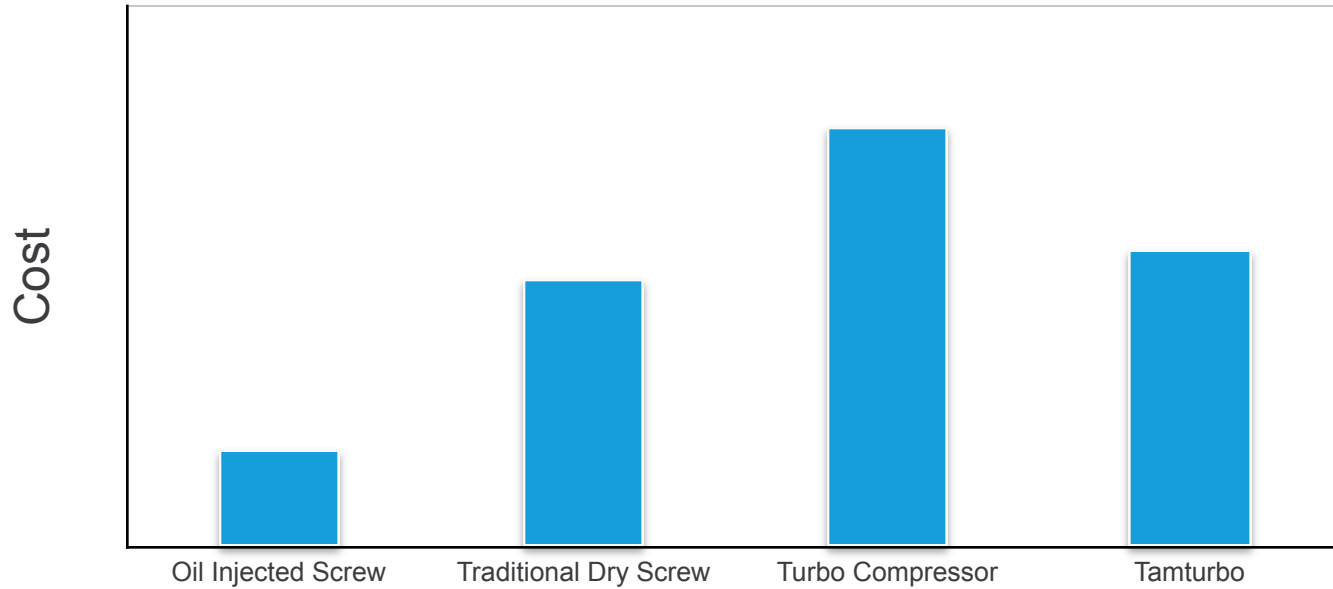




ABSOLUTELY NO OIL IN OUR COMPRESSOR

- We satisfy the quality requirements of our customers
- We eliminate all risks of contaminated air
- We're the natural fit for industries with 0% tolerance for any risk of oil contamination
 - Food & Beverage, Electronics, Chemical, Automotive, Textile, Printing, etc.
- Since the compressor has no oil, there's no oil or oil filters to dispose, recycle or expose into the environment.

Initial investment comparison



MAINTENANCE-FREE TAMTURBO TECHNOLOGY

- Free from rising electric bills
- Free from maintenance
- Free from energy wasting blow-out
- Free from environmental loading
- Peace of mind through top-quality components
- No surprises with remote monitoring system
- The high reliability of our turbo compressors, low hours of downtime and excellent predictability of preventative maintenance let you keep your focus on your daily business.



Did you know that ?

- Traditional oil free compressor are typically around 7 - 7.5 kW/(m³/min) in specific power for new unit, efficiency will be greatly reduced after operation.
- Extreme high compression temperature may cause the rotor coating and efficiency greatly reduced
- Rotor surface re-coating are about 45-50% of the compressor purchasing price, also require replacement of seals and possible gears.

Tamturbo
JUST AIR

User Benefit

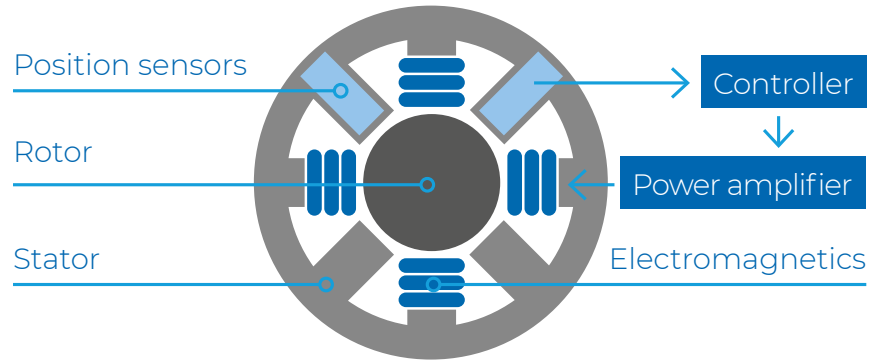


Tamturbo Technology

- Tamturbo® high speed motor
- Tamturbo® Active Magnetic Bearing (AMB)
- Tamturbo® Diffuser Control
- Visual intelligent control panel
- Absolutely user friendly

Tamturbo AMB (Active Magnetic Bearing)

MAGNETIC BEARING FEATURES



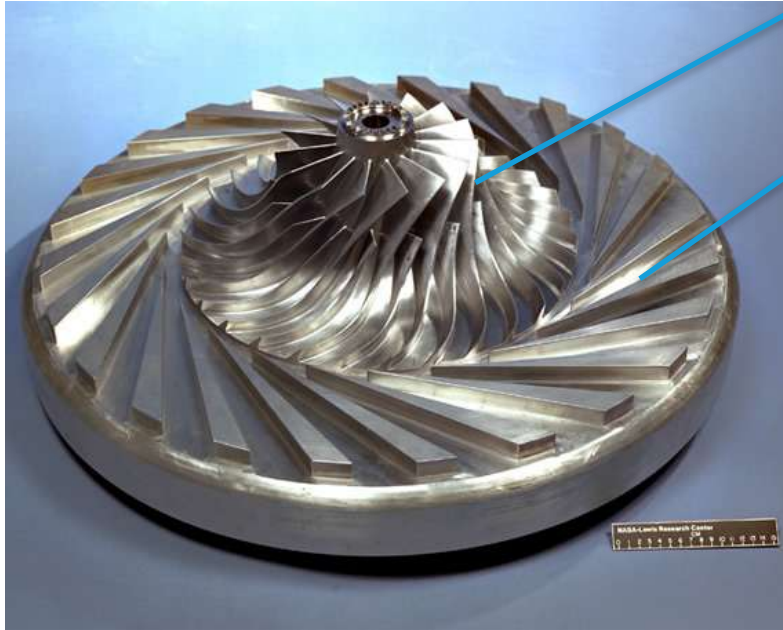
Active magnetic bearings – Five axis active bearings utilize two coils each for precision placement that maintains rotor position with micrometer accuracy.

Tamturbo Titanium Impeller



- Strength is the top among all metal material
- Ultra light weight
- Excellent temperature tolerance
- Excellent anti corrosion capability

Tamturbo Diffuser control



Impeller

Diffuser

Tamturbo patent diffuser control can achieve up to 63% of turn down range that nearly no other traditional dry screw & turbo compressor can reach !

With the precise capacity control that means no blow out, no extra energy waste !

Picture shown is not Tamturbo, example only

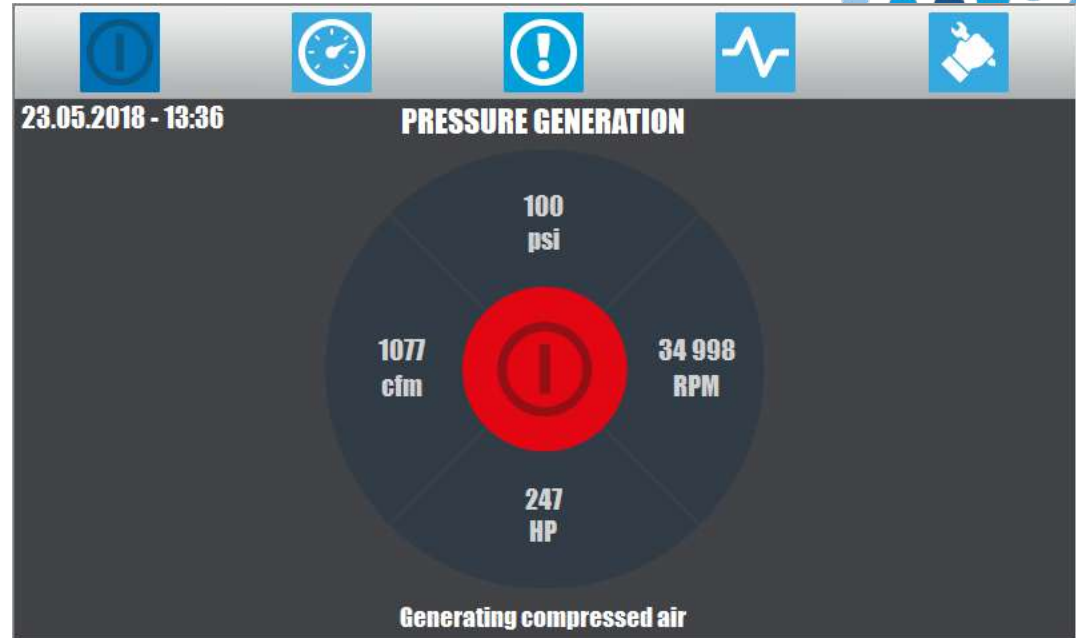
Tamturbo Full Color Touch Panel



- * 44 languages
- * Detailed operation monitor
- * User friendly
- * Communication compatible

Touch Panel - User Menu

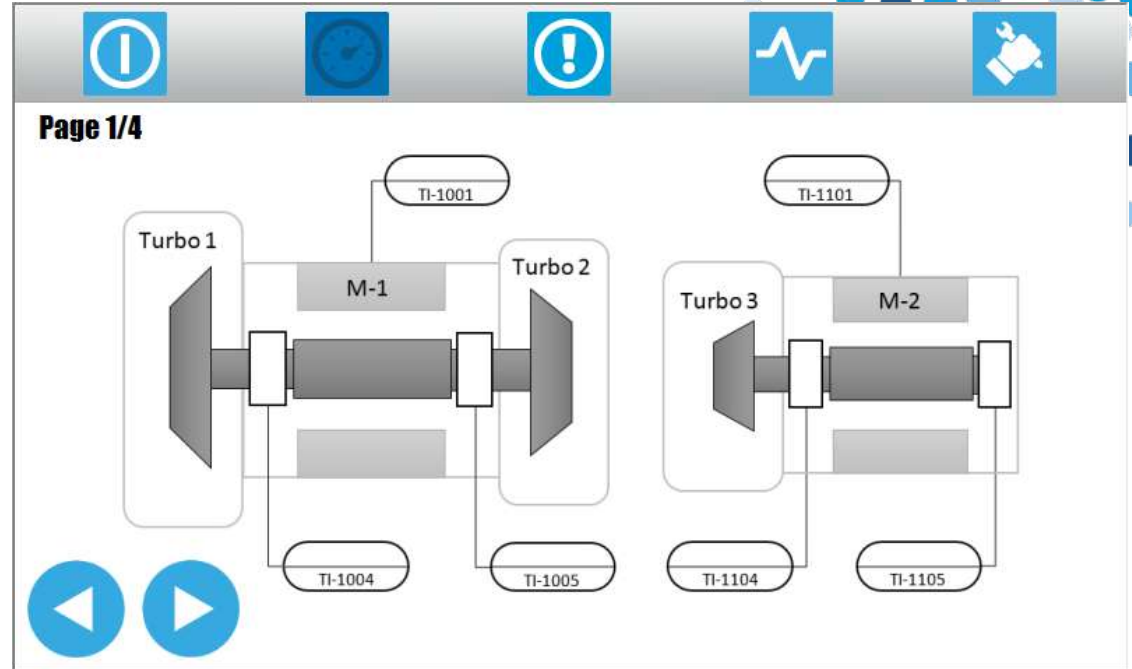
- Instant pressure, RPM, Flow capacity, BHP monitoring
- Easy to operate with no complications setting.



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Touch Panel - High Speed Motor monitoring

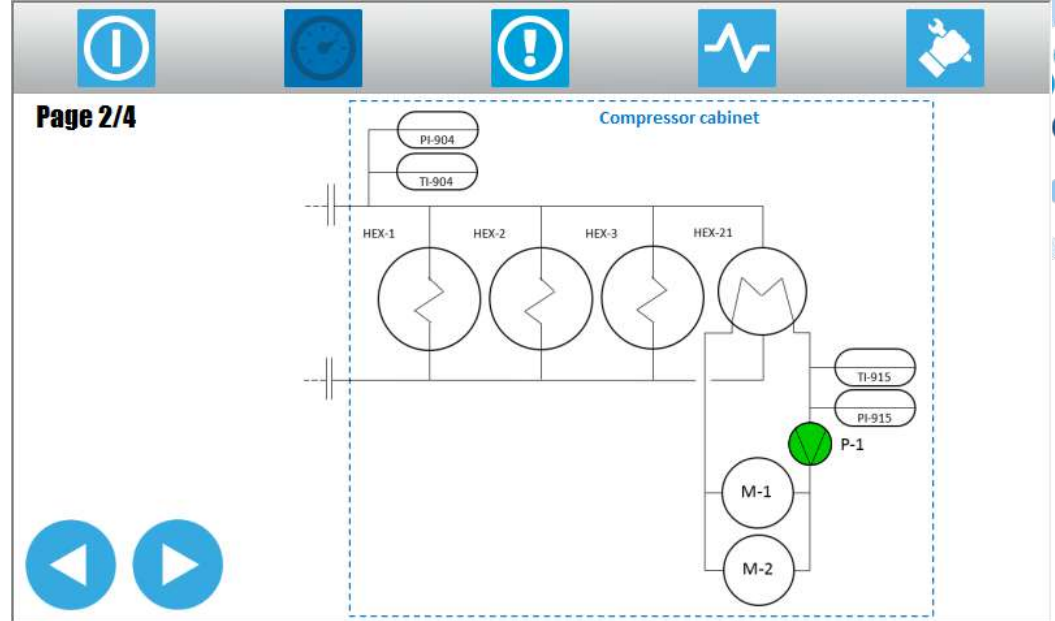
- Instant motor temperature, AMB temperature.
- 24/7 Full color surveillance in action.
- Possible damage & malfunctions will be indicated on the screen instantly.



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Touch Panel - Liquid Recirculation monitoring

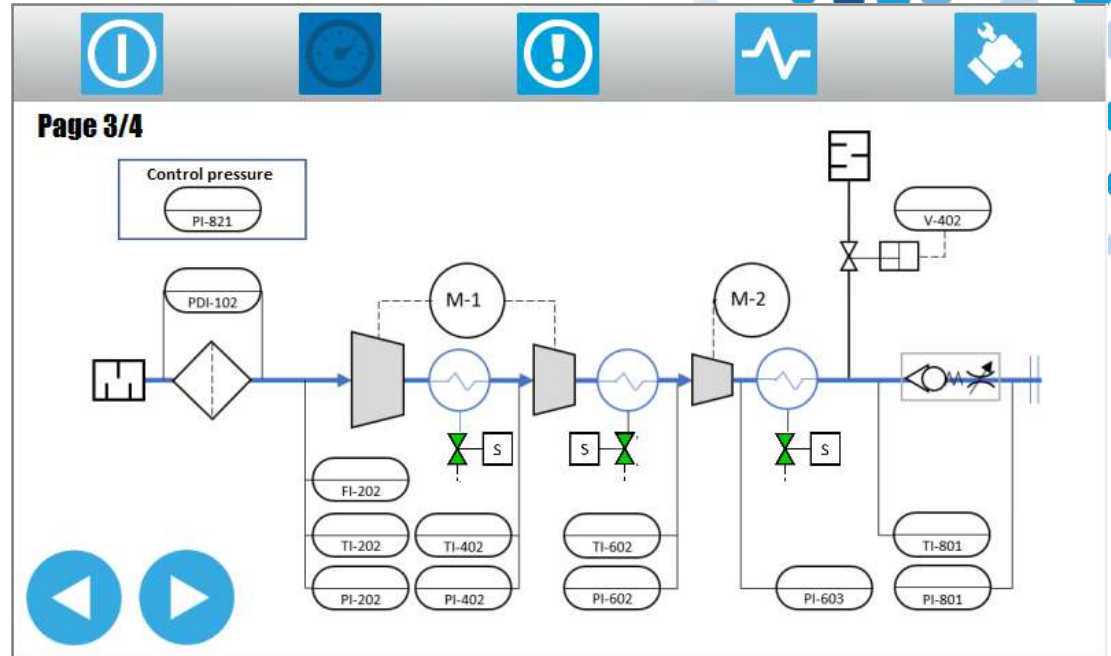
- External cooling temperature & pressure monitoring.
- Internal cooling temperature & pressure monitoring
- Internal recirculation pump condition.



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Touch Panel - Pressure Generation monitoring

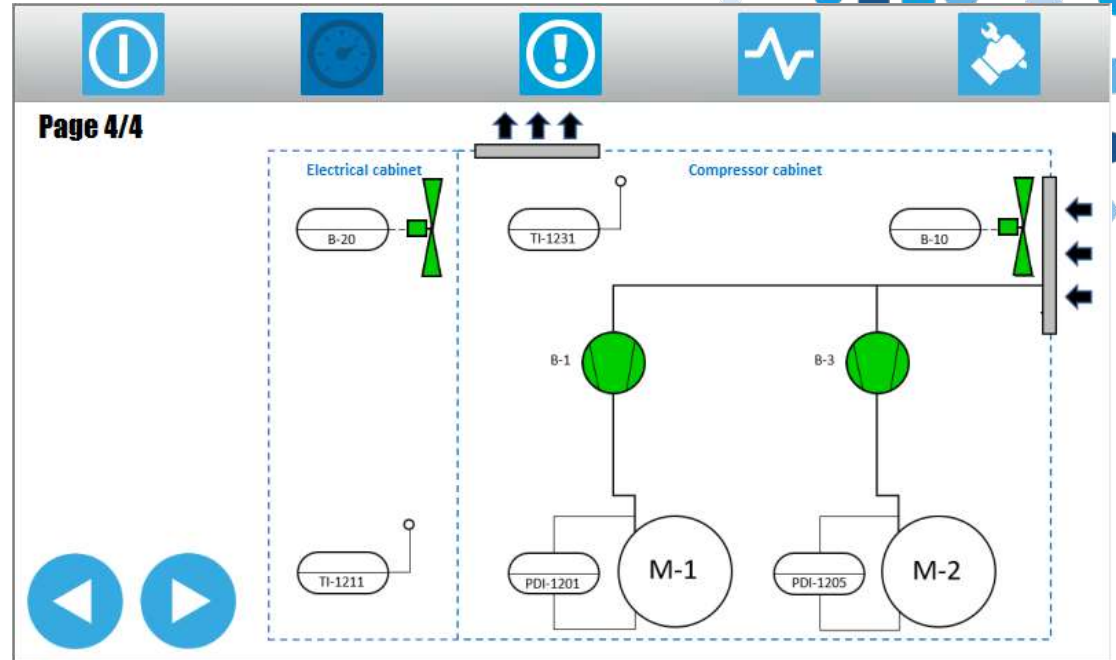
- Monitoring all data in operation
- All stages pressure, temperature & blow off valve ruction are detail indicated on the screen



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Touch Panel - Air Ventilation monitoring

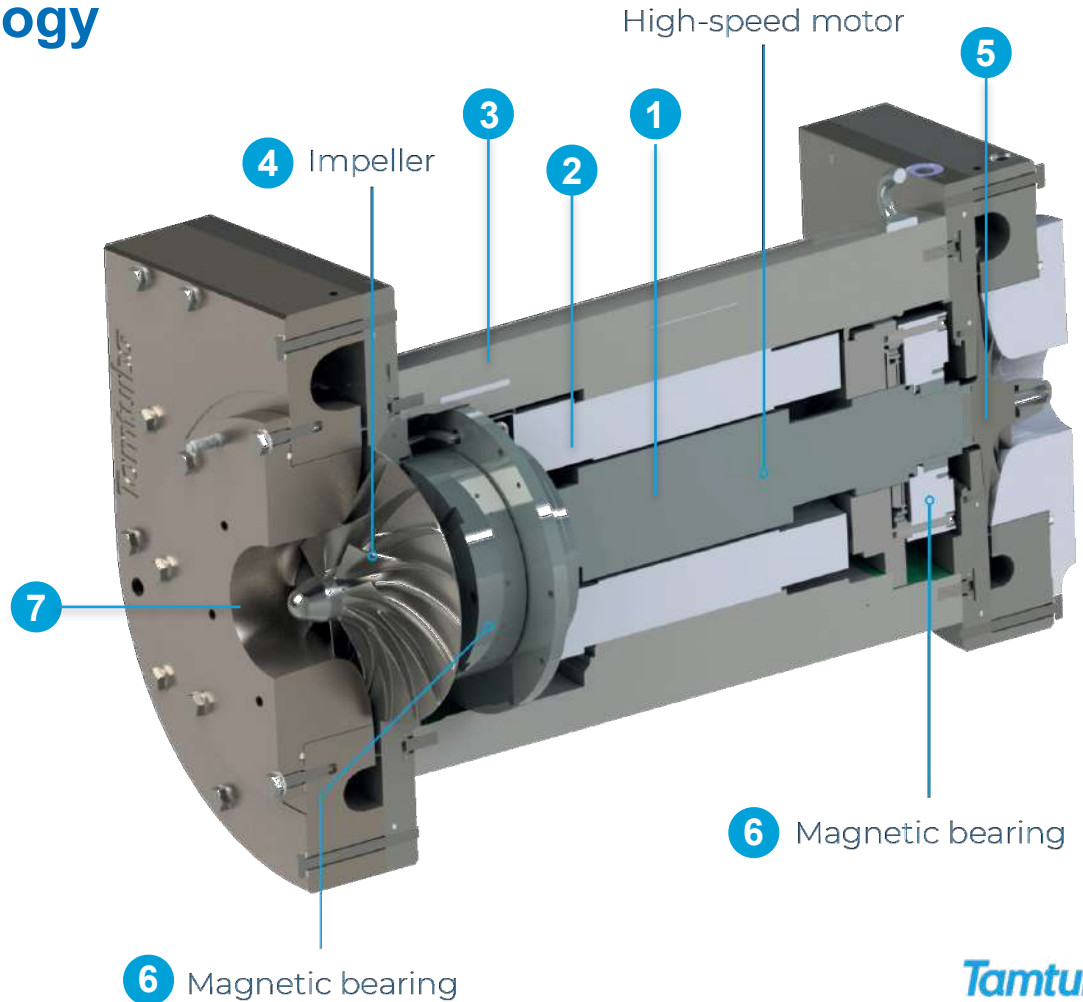
- Compressor condition is monitored separately by electrical & compressor cabinet.
- Ventilation blower fan, motor rotor cooling fan are all in instant operation condition.



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Touch-Free™ Technology

- 1 Rotor
- 2 Stator
- 3 Motor Frame
- 4 1st stage Impeller
- 5 2nd stage Impeller
- 6 Active Magnetic Bearing
- 7 Air suction

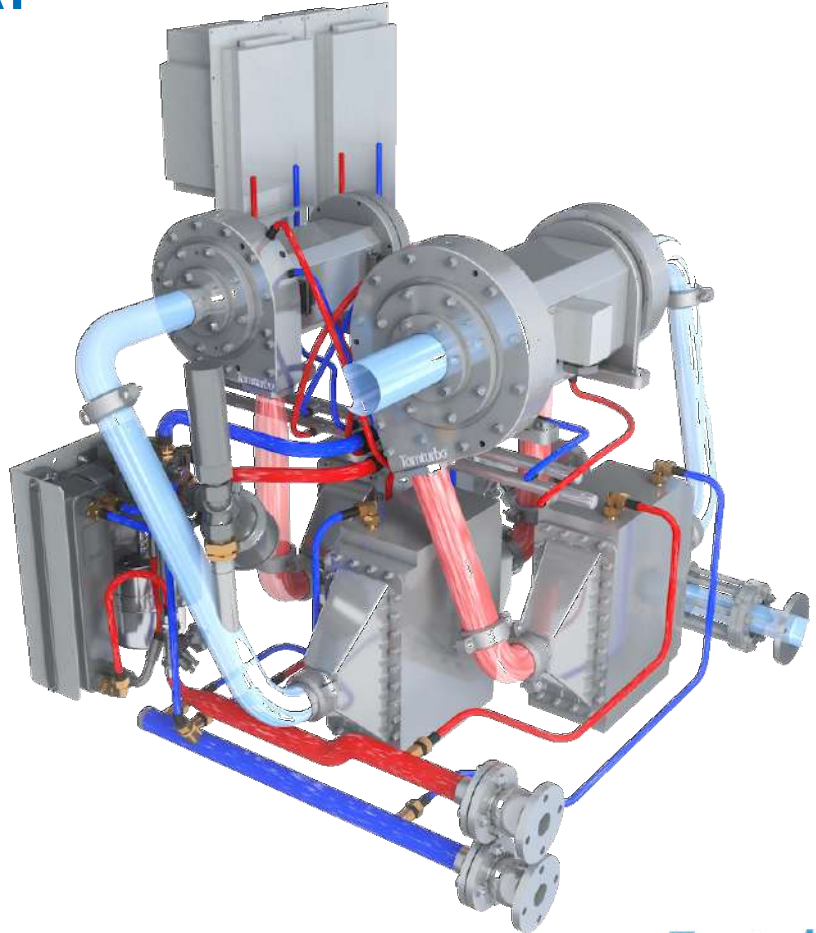


TAKE ADVANTAGE OF THE HEAT

Liquid cooling as standard

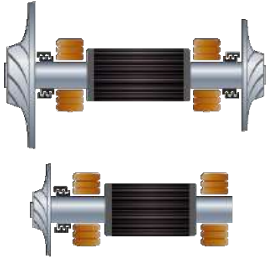
- We recover:
 - Compressed air heat
 - Motor heat
 - Turbo head heat
 - Inverter heat

up to 93% of used energy
recovered into cooling liquid

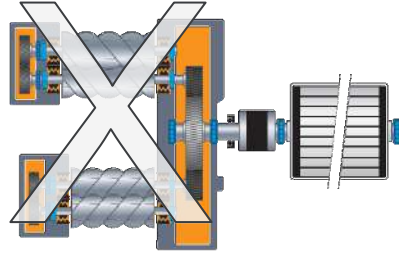


THE LOOK OF RELIABILITY: When Less Is More

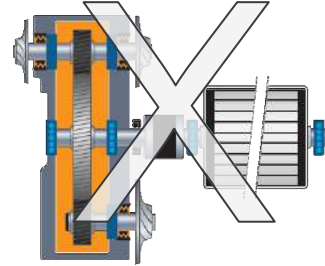
TAMTURBO



"OIL-FREE" SCREW COMPRESSOR



TRADITIONAL TURBO

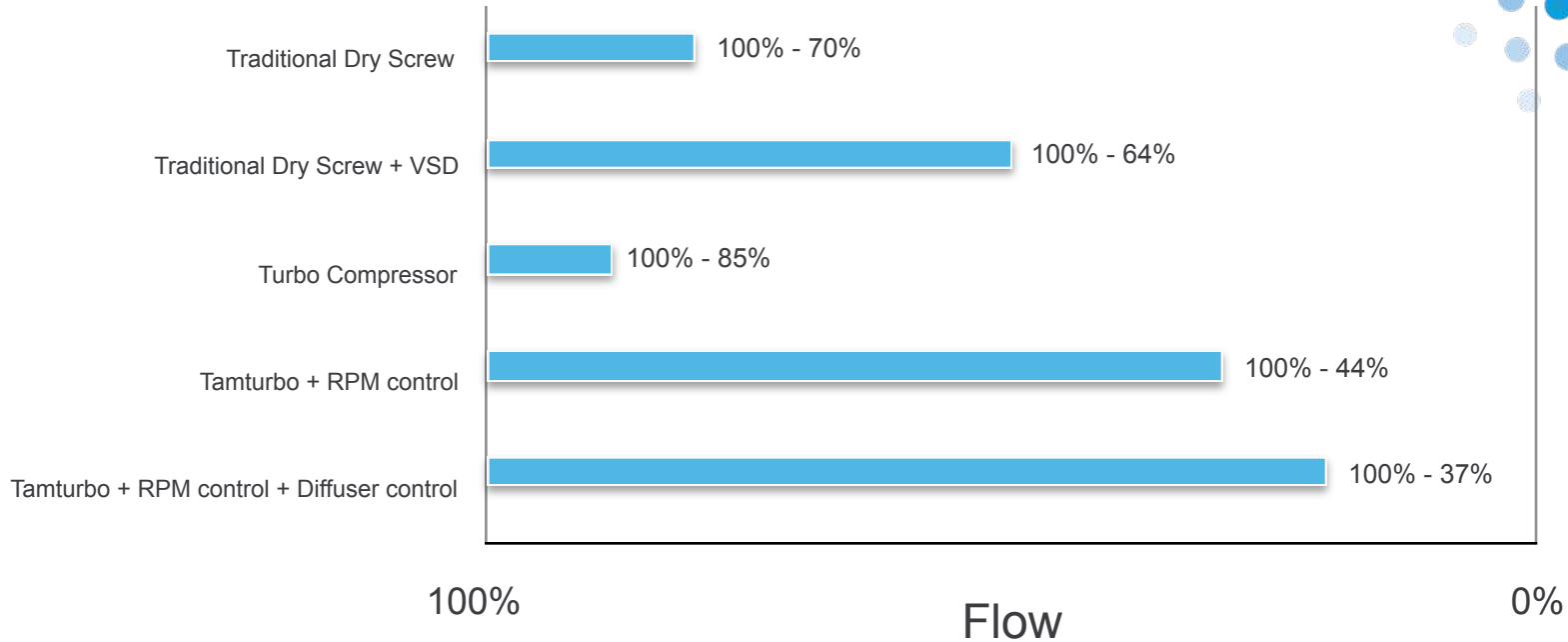


- 100 % Oil-free air
- Turbo compressor
- Gearless high-speed motor
- Active magnetic bearings
- Patented capacity control

Parts WE DON'T HAVE will not fail

- Oil Filter
- Oil Pump
- Oil Demister
- Gear Box
- Bull Gear
- Pinion Gears
- Suction Valve
- Oil Thermostat
- Oil Separators
- Min.Press.Valve
- Motor coupling

Capacity control comparison



WHY TAMTURBO TECHNOLOGY?



Sustainability

- Better and lasting energy efficiency
- 100% oil-free air
- Reducing harmful waste from operations



Reliability

- No wearing parts – no maintenance
- Wide turndown range with high efficiency
- Improved operations and end product quality



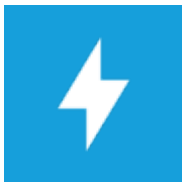
Customers actively seeking alternatives to current technology

- Hidden costs of ownership
- Limited offering of compatible technology

VALUE PROPOSITION



100 %
oil free



>10 % lower
electricity
consumption



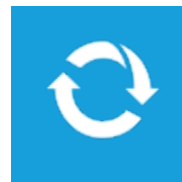
Even 90 % less
maintenance



Smaller size -
no barrier to
change



Less waste
treatment



Over 90 %
energy
recovery



20 - 30 % life cycle savings
30 - 40 k € (35 - 45 k US) / year
600 - 800 k € in life cycle

Significant environmental benefits

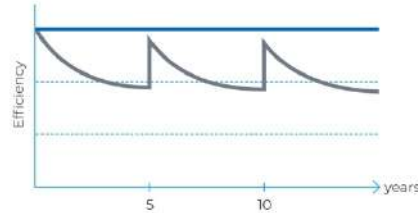
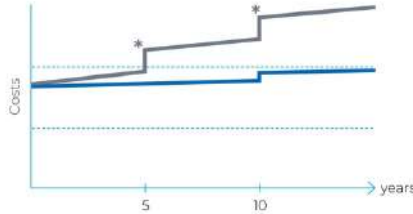
LIFECYCLE COST THAT CAN'T BE TOUCHED



Tamturbo® compressors offer by far the lowest total cost of ownership.

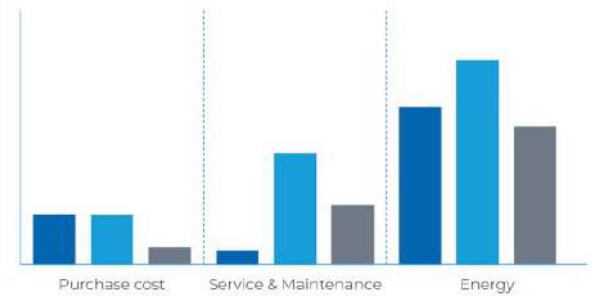
Free from...

- Maintenance
- Rising electric bills
- Energy-wasting blow-off
- Environmental loading



● Tamturbo® High Speed Compressor ● "Oil-free" Screw

* Periodic overhaul with screw element changes



- Tamturbo® compressor
- Similar "oil-free" screw compressor
- Similar oil lubricated screw compressor

PURCHASE ALTERNATIVES

Investment + maintenance

Traditional compressor business

Investment + extended warranty

Up to 10 years. All wearing parts, spare parts and labor included

Touch-Free™ Air

Compressor + all related expenses included

Pricing: €/m³ or €/month

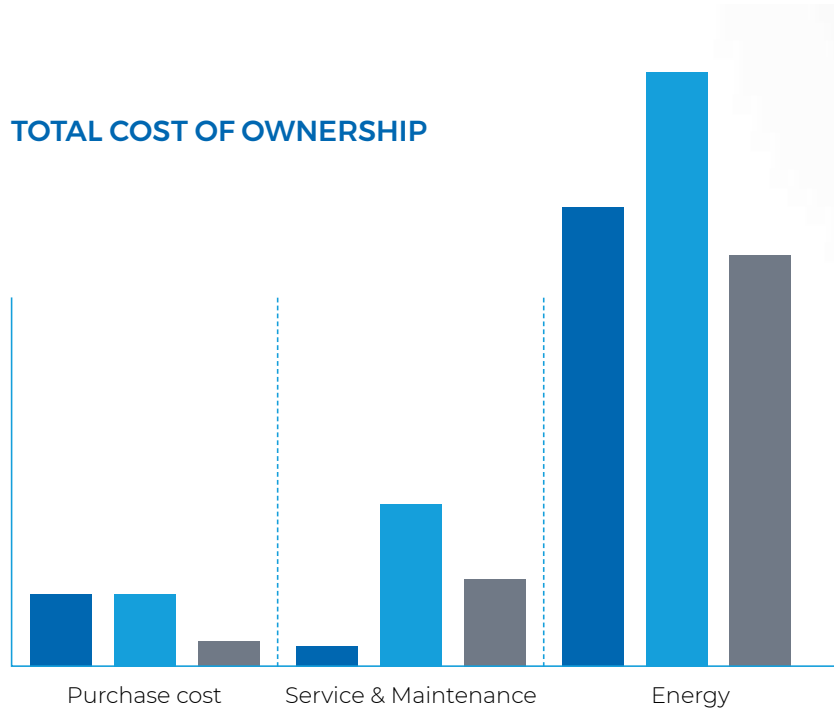
→ production changes easy, adaptive to customer needs, OPEX



Real-time remote monitoring
and optimization

Predictive Maintenance

Total operation cost comparison



Tamturbo technology makes the ROI (Return of Investment) much faster Than the traditional dry screw Compressor

- Tamturbo® compressor
- Similar "oil-free" screw compressor
- Similar oil lubricated screw compressor

PRODUCT RANGE

3-TURBO STAGE PRODUCTS



TT145
5–9 bar
70–130 psia



TT185
5–9 bar
70–130 psia



TT225



TT300

2-TURBO STAGE PRODUCTS



TT60
3–5 bar
40–70 psig



TT115
3–5 bar
40–70 psig



TT135
3–5 bar
40–70 psig



TT155



TT235

Reference Footage

Tamturbo TT325 (400HP) Customer site



Commissioning & Routine check



Reference customers

PROVEN COMPETITIVE ADVANTAGES

PAPERBOARD MILL

- TT60 – 2 –stage 60 kW (80HP), 5bar (75psig)
- Since 2 /2016 in 24/7 use w/o problems or need for service.
- Performance and minimal service requirements proved as promised in the value propositions.



MONDI POWERFLUTE

"The key things we look for in a compressor are reliability, energy efficiency and that it doesn't require extensive maintenance.

We've now been using Tamturbo's 60 kW compressor for >36 months and >25,000 hrs, and I can say that it is very energy-efficient. So far it has not required any maintenance procedures, and apart from a air filter change, I don't foresee any being necessary either.

The fact that the unit is completely oil-less offers significant on-site advantages and suits our long-term sustainability goals perfectly."

Tapio Laukkanen
Technology Manager
Mondi Powerflute Oy



HKScan



“We want to be a benchmark in progress and use innovative solutions in all our operations.

Tamturbo® compressors challenge the traditional technologies. They bring us significant benefits in achieving our energy efficiency goals.

Furthermore, there is no risk of oil contamination in Tamturbo® compressor, which supports our quality and purity requirements.

The absolutely lowest total cost of ownership and Tamturbo’s service-focused attitude were key factor when considering the cooperation with them,”

Mika Tammi
Technical Manager
HKScan

PROVEN COMPETITIVE ADVANTAGES

LARGE FOOD PROCESSING PLANT

- TT185 – 3 –stage 185 kW(250HP)
7 bar (100psig)
- Since 07/2016 in use w/o problems or need
for service
- Performance and minimal service
as promised.
- Customer installed a second unit at another
facility 10/2017



COMPONENTA

”The Touch-Free™ Air contract offered by Tamturbo has lowered the barrier to upgrade the compressed air systems with technology from this millennium without new investment or unpleasant and unexpected maintenance costs in the future.

This further helps us to manage the cost of compressed air production. We only pay for the air we use. By improving the compressed air system, we have been able to significantly reduce the cost of production.

Additionally, we were able to connect our old compressors into the same Tamturbo System Load Control. This makes control of the compressed air production simple. With the system we have adequate airflow in all consumption situations in the most cost-effective way.”

Petri Kulmala
Maintenance Manager
Componenta



PROVEN COMPETITIVE ADVANTAGES

Componenta, high quality casting product supplier

- TT185 – 3 –stage 185 kW (250HP), 5-9bar (70 – 130 psig)
- Tamturbo® Movable Compressor Room with independent cooling system
- Tamturbo® System Load Control – multi-compressor control system

Touch-Free™ Air – subscription service agreement:

- No CAPEX
 - No hidden fees / maintenance costs
 - Invoicing per actual air used
-
- In 2017, Componenta performed an analysis to renew the equipment and to find the most sustainable and the most cost-effective solution
 - They ended up with Tamturbo's with a Touch-Free™ Air service model.



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JUST AIR

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