
Press release

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MAN Energy Solutions Launches New TCT Turbocharger Series

Axial TCT series specifically optimised for Tier III operation, suitable for both conventional and dual-fuelled, two- and four-stroke engines

At a ceremony in Piraeus, Greece on February 7th, 2019, MAN Energy Solutions unveiled its new TCT turbocharger series. The event took place at the premises of the local MAN PrimeServ Academy, the company's after-sales division, where the large invited crowd of guests witnessed MAN Energy Solutions' Ralph Klaunig – Vice President – and Alexander Schäfer – Vice President, After-Sales – personally disassemble a TCT40 turbocharger, testament to its simplified design.

The TCT series has been introduced to accompany and – eventually – replace the TCA generation whose design has been continuously updated since its introduction but is now some 15 years old. With TCT turbochargers, MAN Energy Solutions can significantly reduce turbocharger dimensions to meet current market requirements. The company reports that a key focus during the design phase was a reduction in manufacturing and operating costs while maintaining compliance with thermodynamic requirements.

Klaunig said: "We anticipate a positive market reception for the TCT series, which is a combination of new and proven design features specifically optimised for IMO Tier III engines. We've targetted a smaller, lighter design with a superior charging-efficiency, and a high air-pressure in this new generation. As our guests have just seen, the TCT concept is so service-friendly that even a pair of managers can take a unit apart."

Dionissis Christodoulopoulos, Managing Director MAN Energy Solutions Hellas Ltd., was proud to host the TCT Launch event.

He said: "It was truly a honour for our Greek office to host the global TCT Launch event. Our local two-stroke customers, who have long-standing relationships with MAN, appreciated to witness this new axial turbocharger generation."

The introduction of the TCT series means that MAN Energy Solutions' two-stage turbocharging solution can now achieve efficiency levels of up to 80%, a market-leading accomplishment. MAN Energy Solutions states that it is currently offering just the TCT40 and TCT60 types, but expects the other TCT sizes to come on stream by 2020 and 2021. MAN Energy Solutions states further, that the TCT40 was already sold to two customers and is currently undergoing its first field test, while the TCT60 will be delivered to its first customer mid of 2020.

The company also states that the TCT is not only aimed at low-speed engines, but is also eminently suitable for two-stage turbocharging on four-stroke engines. Alexander Schäfer said: "MAN TCT turbochargers are high-performance solutions that are built upon an unparalleled foundation of proven technology. We have

already signed agreements with some very prominent customers for two-stage turbocharging solutions, testament to the strength of the TCT concept.”

MAN TCT turbochargers are suitable for conventional fuel and dual-fuel engines in both marine and power applications ranging from 6 MW up to 24 MW output per turbocharger.

| Dimensions | | | | |
|-------------------|---------|---------|---------|--------------|
| Type | L in mm | B in mm | H in mm | Weight in kg |
| MAN TCT30 | 2,040 | 1,125 | 1,135 | 1,820 |
| MAN TCT40 | 2,290 | 1,260 | 1,275 | 2,500 |
| MAN TCT50 | 2,580 | 1,420 | 1,435 | 3,455 |
| MAN TCT60 | 2,900 | 1,595 | 1,610 | 4,735 |
| MAN TCT70 | 3,250 | 1,790 | 1,805 | 6,480 |
| MAN TCT80 | 3,650 | 2,010 | 2,028 | 8,890 |

TCT series sizes for two-stroke engines. All weights and dimensions are for guidance (project-specific requirements can lead to deviating values). Graphic courtesy MAN Energy Solutions

| Supercharged Engine Output | |
|-----------------------------------|--------|
| Type | [kW] |
| MAN TCT30 | 7,500 |
| MAN TCT40 | 9,460 |
| MAN TCT50 | 12,000 |
| MAN TCT60 | 15,120 |
| MAN TCT70 | 19,040 |
| MAN TCT80 | 24,030 |

TCT series' specific air consumptions (le) 7.5 kg(kWh) for two-stroke engines. Graphic courtesy MAN Energy Solutions



From left to right: Kemal Oguz Coban, Sales & Promotion Manager / Ralph Klaunig, Head of Turbocharger Sales / Klaus Faul, Superintendent / Alexander Schäfer, Head of MAN PrimeServ Turbocharger / Oswald Löwlein, Chief Design Engineer TCT Turbocharger Series / Dionissis Christodouloupoulos, Managing Director MAN ES Hellas



Rendering of the TCT turbocharger from MAN Energy Solutions

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.