



POWER GENERATION LINE-UP

**Our efficiency.
Your edge.**

fptindustrial.com



T4 Final Bare Engines.....4-5

The Stage V Challenge..... 6-8

FPT Industrial’s Stage V Solution..... 9

Stage V Scenario 10

FPT Industrial’s Answer 11

HI-eSCR2 Technology.....12

HI-eSCR2 Patents13

HI-eSCR2 Main Components 14-15

Stage V Switchable Tier 4 Final 16-17

ATS Power Pack18-19

Smart Installation Package 20

Designed with customers needs in mind21

Tier 4 Final

Engine Portfolio

Engine Model	kW/HP	ECU	Cylinder Arrangement Air Intake	Injection System
F34	37/49	EDC17	4L/TC	ECR
F34	55/74	EDC17	4L/TC	ECR
F34	75/101	EDC17	4L/TCA	ECR
F34	93/125	EDC17	4L/TCA	ECR
N45	86/115	EDC17	4L/TCA	ECR
N45	126/169	EDC17	4L/TCA	ECR
N67	146/195	EDC17	6L/TCA	ECR
N67	168/225	EDC17	6L/TCA	ECR
N67	195/262	EDC17	6L/TCA	ECR
N67	223/300	EDC17	6L/TCA	ECR
CURSOR 9	260/349	EDC17	6L/TCA	ECR
CURSOR 9	282/378	EDC17	6L/TCA	ECR
CURSOR 9	309/414	EDC17	6L/TCA	ECR
CURSOR 9	330/443	EDC17	6L/TCA	ECR
CURSOR 13	353/473	EDC17	6L/TCA	ECR
CURSOR 13	380/510	EDC17	6L/TCA	ECR
CURSOR 13	424/569	EDC17	6L/TCA	ECR

Legend

Cylinder Arrangement

L In line

Air Intake

TCA Turbocharged Aftercooler

TC Turbocharged

Exhaust System

DOC Diesel Oxidation Catalyst

PMcat Particulate Matter Catalyst

HI-eSCR2 FPT Industrial's patented system

Displacement (Liters)	Emission	Exhaust System	60 Hz / 1800 rpm	
			Stand-by Power	Prime Power
			kWe	kWe
			3.4	Tier 4 Final
3.4	Tier 4 Final	DOC+PMcat	46	41
3.4	Tier 4 Final	HI-eSCR	65	59
3.4	Tier 4 Final	HI-eSCR	83	75
4.5	Tier 4 Final	HI-eSCR	77	70
4.5	Tier 4 Final	HI-eSCR	112	102
6.7	Tier 4 Final	HI-eSCR	131	118
6.7	Tier 4 Final	HI-eSCR	147	133
6.7	Tier 4 Final	HI-eSCR	173	157
6.7	Tier 4 Final	HI-eSCR	199	181
8.7	Tier 4 Final	HI-eSCR	233	211
8.7	Tier 4 Final	HI-eSCR	253	229
8.7	Tier 4 Final	HI-eSCR	281	255
8.7	Tier 4 Final	HI-eSCR	301	273
12.9	Tier 4 Final	HI-eSCR	322	292
12.9	Tier 4 Final	HI-eSCR	347	314
12.9	Tier 4 Final	HI-eSCR	389	352

Injection System

ECR Electronic Common Rail

Emission Regulation

T4F Tier 4 Final

Engine Family

F = F5

N = NEF

C = CURSOR

THE STAGE V CHALLENGE

Technological excellence and product innovation for FPT Industrial represent the truly determining factor and part of its primary strategic mission. The company has focused its research and development activities in order to become the innovation leader in the agriculture and construction powertrain field and a reference provider of the most advanced solutions for emission compliance. This expertise is available also for Power Generation engines.

FPT Industrial engines comply with any emission legislations worldwide, always ensuring advantages on performance and efficiency, even at the most stringent regulations through the patented HI-eSCR technology.

The breakthrough HI-eSCR technology Tier 4 Final, based on more than 25 years of experience and 1.000.000 units produced, allows our engines to meet Tier4 Final standards, guaranteeing the highest NO_x conversion efficiency (over 95% versus 80-85% of best competitors) with a maintenance-free system.

The evolution of HI-eSCR Tier 4 Final into HI-eSCR2 makes FPT Industrial engines comply with both Tier4 Final and the Stage V regulation, still granting the outstanding results of best-in-class performance and total costs of ownership.

FPT Industrial's Stage V Solution

- High Productivity
- Enhanced reliability
- Reduced operating costs
- Maximised uptime
- "For life" after-treatment systems

High Performance Best in class power and torque density.

Low Operating Costs Best in class fluid consumption.
Maintenance-free after-treatment system:
no replacement costs over lifecycle.

Ease of Use Extended service intervals.

Scenario

During the combustion process, the chemical energy of the fuel is converted into mechanical energy. Because of the chemistry of combustion, several pollutants are produced, of which the most harmful are Nitrogen Oxides (NO_x) and Particulate Matter (PM).

Since 2011, when the European* Stage IIIA came into force, many efforts have been made to reduce such pollutants damaging the environment.

EPA Tier 4 Final regulation, introduced in 2014, implied a further significant reduction of NO_x (-80% Vs. previous step) while PM is not affected by further reductions.

Stage V is a new regulatory step that has been introduced in Europe from 2019 (depending on engine power level), further tightening the limits on PM emissions: admitted PM quantity is reduced by 90% compared to Stage IIIA and a new limit has been introduced on the number of emitted particles (Particle Number Limit, PN).

In addition, Stage V regulation involves previous and current power ranges with little or no legislation at all in Europe (power ranges below 37kW or above 560kW).

FPT Industrial's Answer

Wherever energy has to be delivered quickly and reliably, FPT Industrial provides the optimal answer with its state-of-the-art range of engines for Power Generation applications.

To fulfill market requirements, FPT Industrial has developed different engine ranges respectively compliant with most demanding Emissions Standards. FPT Industrial products offer functional layouts, hi-tech contents and carefully selected top quality components as well.

*FPT Industrial is a global engine manufacturer focused on providing high-quality engines that meet or exceed the most stringent global emission guidelines. The FPT engine line-up is tailored to each region's specific emission standards, which allows FPT to always be one step ahead.

HI-eSCR2 Technology

Stage V:


To maintain the advantages of the unique and unbeaten HI-eSCR technology, FPT Industrial integrates a maintenance-free filtering device on its SCR catalyst, thus allowing to comply with tightened limits on PM emissions within a compact package.


Applicable for engines above 56kW and below 560kW, the second generation HI-eSCR2, traps and oxidizes the Particulate Matter, converts NO_x into Nitrogen (N_2) and water (H_2O) thanks to the chemical reaction of Ammonia (NH_3).

The result is a reduction of NO_x superior to 95% and the PM levels within Stage V emission limits.

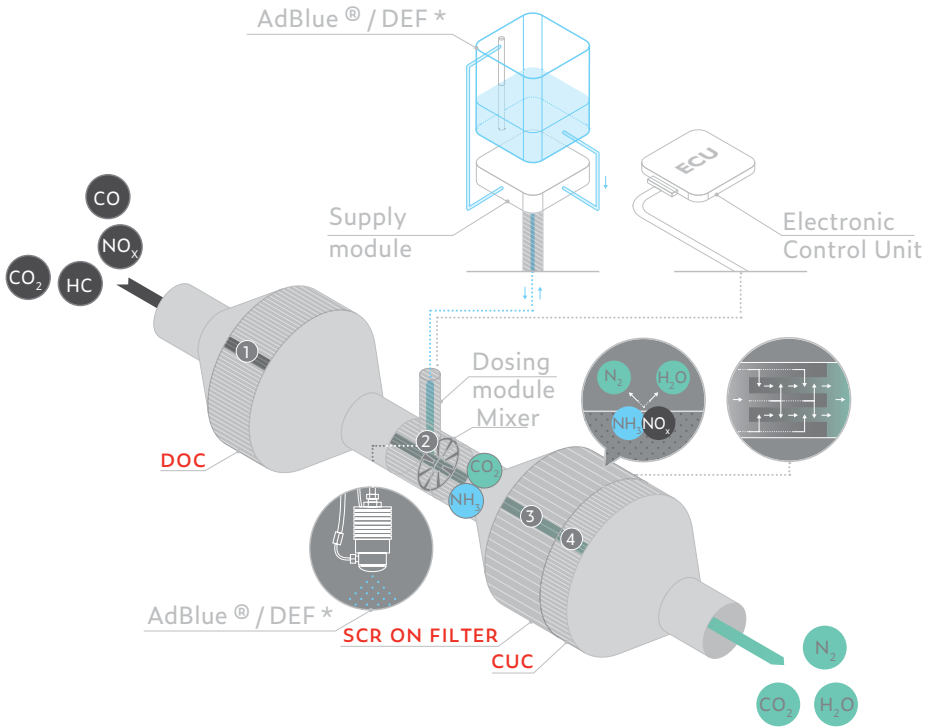
Thanks to optimized combustion, leadership on performance and fuel efficiency are confirmed.

HI-eSCR2 Patents

 "Closed" loop control through dedicated sensors to provide accurate monitoring of exhaust gas composition; adaptive dosing system to optimize AdBlue consumption

 ClosedThermally insulated high turbulence mixer to allow homogeneous AdBlue evaporation and urea hydrolysis ensuring correct distribution in exhaust gas flow

 Optimized exhaust gas temperature control to speed up SCR light-off in cold part of the mission

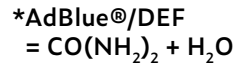


1. Diesel Oxidation Catalyst
 NO → NO₂
 HC, CO and PM oxidation

2. AdBlue* / DEF Injection
 Hydrolysis →
 NH₃+CO₂

3. Selective Catalytic Reduction on filter
 NO and NO₂ reduction by NH₃ to N₂ and H₂O
 PM oxidation with NO₂

4. Clean Up Catalyst
 Residual NH₃ oxidation



Legend

PM Particulate Matter
 HC Unburnt Hydrocarbons

NO_x Nitrogen Oxides
 CO Carbon Monoxide
 N₂ Nitrogen

CO₂ Carbon Dioxide
 H₂O Water

HI-eSCR2 Main Components

HI-eSCR2 main components are:

- ✓ *The DEF/AdBlue Supply Module*
.....
- ✓ *The DEF/AdBlue Dosing Module*
.....
- ✓ *The Diesel Oxidation Catalyst (DOC)*
.....
- ✓ *The DEF/AdBlue Mixer*
.....
- ✓ *The Selective Catalytic Reduction (SCR) on filter*
.....
- ✓ *The Clean Up Catalyst*

The whole system is fitted with a network of integrated sensors to control, among others, the NO_x and any excess of NH_3 (ammonia) produced.

Exhaust gas flow coming from the engine enters the DOC, where NO is oxidised to NO_2 , in order to maximize SCR catalyst's efficiency conversion.

The ECU (Engine Control Unit), the brain behind the HI-eSCR2 system, checks, through integrated sensors network, the amount of Water-Urea (DEF/AdBlue) solution to be injected in the exhaust pipe. To increase the durability of the injector, Dosing Module is cooled by the engine coolant.

The HI-eSCR2 after-treatment system adopts a filtering device on its SCR catalyst. At the same time as trapping and oxidizing the Particulate Matter, the catalyst converts NO_x into Nitrogen (N_2) and water (H_2O) thanks to the chemical reaction of Ammonia (NH_3) generated from DEF/Adblue. In the end, the integrated CUC eliminates the remaining Ammonia (NH_3). The result is a reduction of NO_x superior to 95% and the PM levels within Stage V emission limits.

Stage V/Tier 4F Switchable

G-Drive Engines Portfolio

Engine Model	kW/HP	Cylinder Arrangement Air Intake	Injection System	Displacement (Liters)	Emission
F34	37/49	4L/TC	ECR	3.4	Stage V / Tier 4F
F34	55/74	4L/TC	ECR	3.4	Stage V / Tier 4F
F34	55/74	4L/TCA	ECR	3.4	Stage V / Tier 4F
F36	71/95	4L/TCA	ECR	3.6	Stage V / Tier 4F
F36	94/126	4L/TCA	ECR	3.6	Stage V / Tier 4F
F36	105/141	4L/TCA	ECR	3.6	Stage V / Tier 4F
N67	175/235	6L/TCA	ECR	6.7	Stage V / Tier 4F
N67	230/308	6L/TCA	ECR	6.7	Stage V / Tier 4F
C87	292/392	6L/TCA	ECR	8.7	Stage V / Tier 4F
C87	338/453	6L/TCA	ECR	8.7	Stage V / Tier 4F
C13	411/551	6L/TCA	ECR	12.9	Stage V / Tier 4F
C13	450/603	6L/TCA	ECR	12.9	Stage V / Tier 4F

FPT Tier4F/Stage V engine are switchable from 60Hz / 1800rpm to 50Hz/1500 rpm

Legend

Cylinder Arrangement

L In line

Air Intake

TCA Turbocharged Aftercooler

TC Turbocharged

Exhaust System

DOC Diesel Oxidation Catalyst

DPF Diesel Particulate Filter

HI-eSCR2 FPT Industrial's patented system

SCRoF Selective Catalyst Reduction on Filter

SCR Selective Catalyst Reduction

Exhaust System	Exhaust System	60 Hz / 1800 rpm	
		Stand-by Power	Prime Power
		kWe	kWe
EGR+DOC+DPF	DOC+DPF	33	30
EGR+DOC+DPF	DOC+DPF	42	38
EGR+DOC+DPF	DOC+DPF	47	46
EGR+DOC+DPF+SCR	HI-eSCR2	60	54
EGR+DOC+DPF+SCR	HI-eSCR2	82	74
EGR+DOC+DPF+SCR	HI-eSCR2	92	92
DOC+SCRoF	HI-eSCR2	153	138
DOC+SCRoF	HI-eSCR2	206	186
DOC+SCRoF	HI-eSCR2	265	240
DOC+SCRoF	HI-eSCR2	304	276
DOC+SCRoF	HI-eSCR2	360	325
DOC+SCRoF	HI-eSCR2	400	362

Injection System

ECR Electronic Common Rail

Emission Regulation

St.V/T4F Stage V switchable Tier 4 Final

Engine Family

F = F5

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ATS POWER PACK

SMART INSTALLATION PACKAGE



Smart Installation Package

In highly regulated markets, legislation introduced a further reduction on emission limits for mobile and prime power applications.

To comply with these new emission limits and make machine upgrade easier, FPT Industrial presents a new, smart installation package: After Treatment System installation solution (ATS Pack).

The ATS Pack includes all key after-treatment components in a single package: main catalysts and their relative sensors are included in a compact and pre-assembled set that requires no dedicated design or installation of ATS components.

The pre-packed ATS solution has a pre-validated design in terms of fluid-dynamics, manifold layout and the position of sensors in order to make the final validation process both leaner and easier.

The ATS Pack provides outstanding installation flexibility as it is available as a ready-to-use ATS solution (horizontal or vertical position).

With the ATS Pack, all electrical signals and connections are managed by a single cable for fast, reliable and quick connection to any engine.

All productivity benefits of FPT Industrial technology come in a simple package, with high performance and efficiency. The innovative After Treatment Technology ensures high emission standards compliance with a maintenance-free solution.

The ATS Pack is designed for switchability, which allows seamless emissions compliance across different regions using the same power solution. There is also no need to install additional components or modify hardware or software. This results in more efficient inventory and warehousing management and greater product flexibility. Switchability is critical to the inventory-control needs of rental companies and international businesses.

Designed with customers needs in mind

Design

- Effective pre-assembled, pre-cabled and pre-validated solution (from 10 components to 1) for lean application sign-off and easy installation.
- FPT Industrial technological know-how guarantees the best product reliability
- No need to design a solution means time and cost savings for customers
- No need to scout new component suppliers for purchasing departments
- Optimized product inventory thanks to improved warehouse space management and complexity reduction
- ATS pack equivalent to current silencer

Flexibility

- Space effective: possibility to choose horizontal or vertical position to meet the needs of any customer

Plug-and-play

(Preassembled Solution)

Production process will run faster and with less downtime thanks to:

- Fewer components to manage
- Fewer production steps and assembly time
- Fewer assembly machines and equipment
- Fewer defaults in production process
- Less stock due to lower non-conforming products

Installability

- Easy to install thanks to rectangular shape, which fits simply into the Genset layout
- ATS pack is equivalent to current silencer: no need to change installation process
- Reduced delivery delay risk due to reduced downtime in installation process







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