



CATTRAP™ for diesel engines

Cattrap™ from Engine Control Systems is an integrated diesel particulate filter and silencer, which effectively removes particulate (PM).

Cattrap™ is particularly designed for use in enclosed non-road operations, for instance in mines and tunnels, as NO₂ emissions are not increased.

The separated particulate (soot) is automatically burnt off (passive regeneration) at exhaust temperatures reaching or exceeding 360° C.



FUNCTION

When the exhaust passes through the micro-porous filter walls the soot particles in the exhaust are separated and collected. The catalytic coating lowers the ignition temperature of the soot to approx. 360° C and the collected soot is automatically burnt off during operation. At operating temperatures less than 360° C the filter can be equipped with electrical heaters to regularly burn off the collected soot.

The filtration is so efficient that any debris passing through the engine combustion chamber will also be collected (i.e. lube-oil ash, wear metals, intake air debris etc.). This debris should be removed to prevent excessive build-up. The cleaning intervals will depend on the conditions of the engine and operation conditions.

APPLICATION

The ECS Cattrap™ was specifically developed for the needs of mining operations in 1990. Cattrap™ features an advanced base metal soot ignition catalyst coated on a Corning Duratrap filter, which promotes filter regeneration without producing toxic NO₂ emissions.

Cattrap™ is intended for permanent installation on vehicles and machines. A Cattrap™ will typically remove at least 85% of emitted particulate matter (PM) and can be used where four stroke engine exhaust temperatures reach or exceed 360 ° C for at least 25% of the equipment duty cycle. At lower temperatures the separated particles will be stored in the filter and increase backpressure. Idle periods should be kept to a minimum.

Exhaust temperature is dependent on a number of variables such as duty cycle, soot composition, make of engine etc. If a vehicles' duty cycle is in question, data logging will be performed to ensure the filter will regenerate during the vehicles' current and normal operation. The engine must also be in a good condition to ensure time for the catalytic coating to burn off the particulate separated in the filter. Typical data logging is 3-5 working days. ECS can supply the data logger which should be returned after use. The data will be analysed by ECS, and the suitability of the duty cycle will be reported.

ECS recommends the use of Low-Sulphur Diesel . Fuel containing higher levels of sulphur will reduce efficiency and shorten the maintenance intervals.

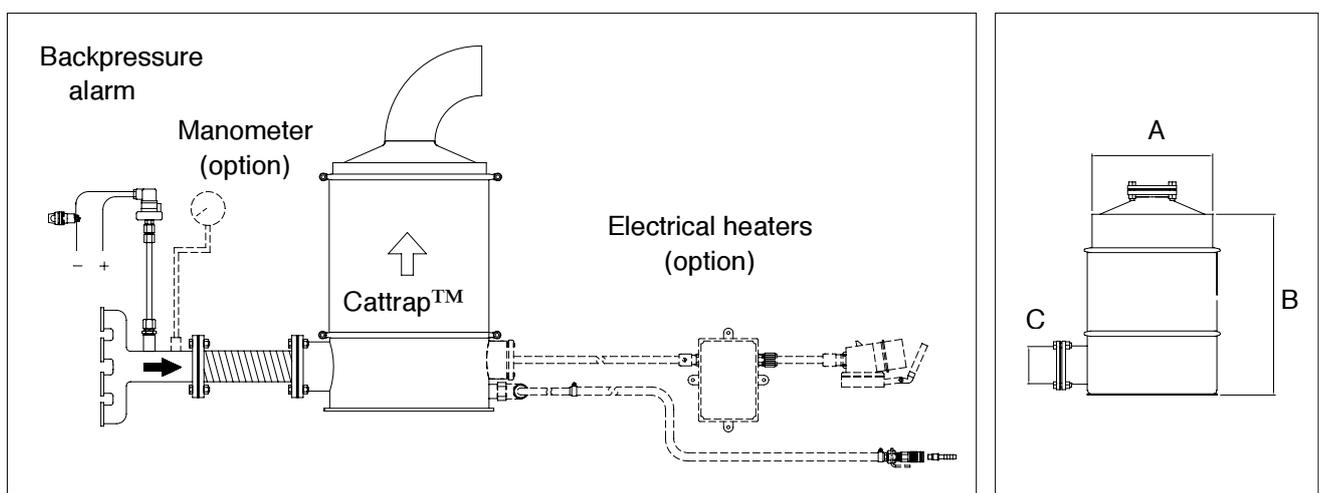
DESCRIPTION

The system consists of:

- A Cattrap™ which is mounted in the exhaust system in place of the original silencer.
- An indicator lamp, which is mounted in the driver's cab to warn of high backpressure.

Options

- A manometer which continuously monitors the backpressure.
- Electrical heaters for regular regeneration of the filter on the vehicle.
- A CombiClean™ station for regular maintenance and cleaning of the filter.



DESIGN

The Cattrap™ housing is manufactured of stainless steel and consists of an inlet section, a filter section, and an outlet section. The sections are assembled with quick-release clamps that allow easy dismantling for inspection and service. The choice of inlet and outlet sections depends on the installation. The filter part is sized according to the exhaust volume from the engine. The inlet and outlet sections are of the same design as is used for ECS' wellknown Unikat COMBIFILTER, see specification below.

INLET AND OUTLET SECTIONS FOR CATTRAP™

The choice of inlet and outlet sections depends on the installation of the vehicle. All inlet sections incorporate mounting plates for vertical installation. The inlet and outlet sections can be supplied with brackets for horizontal installation on request.

When ordering, please inform us whether you prefer a vertical or horizontal installation and if the inlet section should be equipped with electrical heaters, see options.

Inlet section

Typ B1 Inlet section with bottom inlet (axial)

Typ B2 Inlet section with side inlet (radial)

Outlet section

Typ T2 Outlet section with top outlet (axial)

Typ T7 Outlet section with side outlet (radial)

PRODUCT SIZING

Dimensions

To obtain the proper filter size, the engine make, maximum allowed backpressure and driving conditions must be known. The chart below shows the recommended air intake flow for each filter size. If you do not have the actual OEM intake air flow, use the general equation below to determine the approximate value for four-stroke engines.

$$\text{Engine intake air flow (m}^3\text{/h)} = \frac{\text{Engine displacement (liters)} \times \text{max RPM of engine} \times \text{VE} \times 60}{2000}$$

VE = 0,85 for normally aspirated engines

1,7 for turbocharged

2,0 for turbocharged and aftercooled

Please contact Engine Control Systems or your local distributor for further sizing information.

Intake airflow m ³ /h	Max. cyl.volume Liter	Model	Weight kg	A mm	B mm	C ø mm
510	7	CT13	22	275	370	100
670	8	CT17	30	350	520	100
830	10	CT20	32	350	520	100
950	11	CT23	35	350	570	100
1100	12	CT28	38	350	570	100

Dual Cattraps for larger engines, contact ECS.

REDUCTION

The Cattrap™ effectively removes particulate (PM) and is also a silencer.

Typical reduction*:

- Particulate (PM) 89 %
- Nitrogen dioxide (NO₂) no increase
- Silencing > 15 dB

*Cattrap™ was fully tested in 2002 by Mine Safety and Health Administration (MSHA), USA. MSHA has recognised the Cattrap™ as the only catalyzed diesel particulate filter that does not promote NO₂ formation. Tests even showed a reduction of NO₂ emissions over the test cycle ISO 8178, 8 mode.

WARRANTY

Engine Control Systems' products are warranted for workmanship and defects of material for a period of 12 months or maximum 2000 operation hours. The obligation of this warranty is limited to the replacement of the product. The provisions of this warranty do not apply to the product incorrectly chosen, or installed or operated, nor to any product that has been subjected to damage or negligence. Engine Control Systems shall not be liable for any incidental or consequential damages or for breach of any express or implied warranty.

For further service or for information on our other products, please contact ECS or our distributors.

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