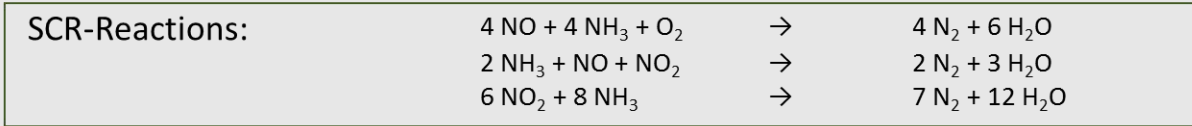
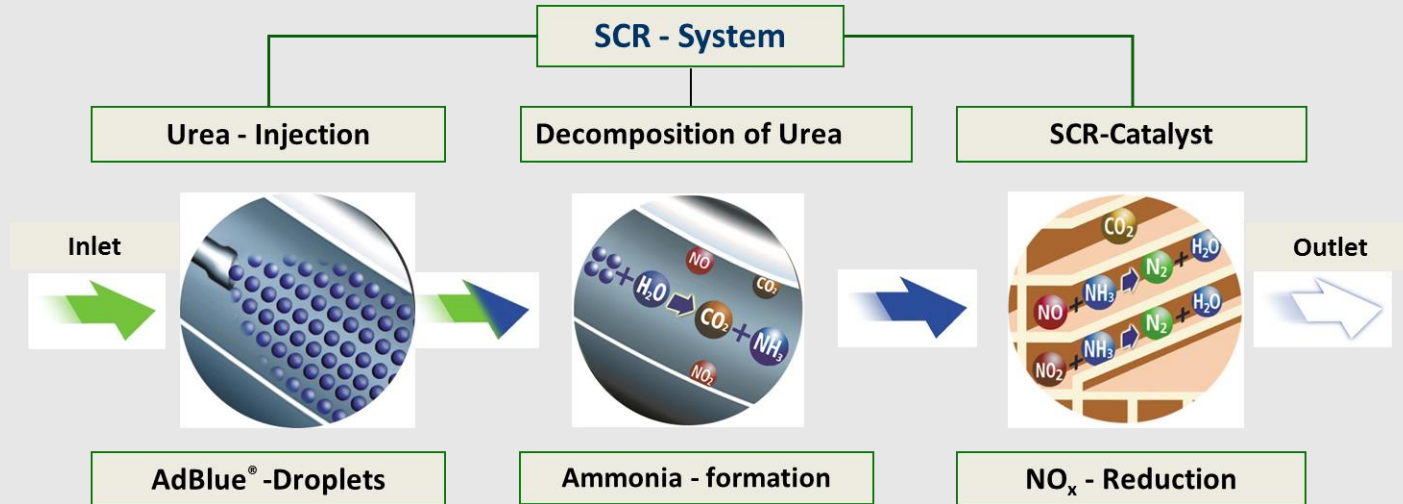




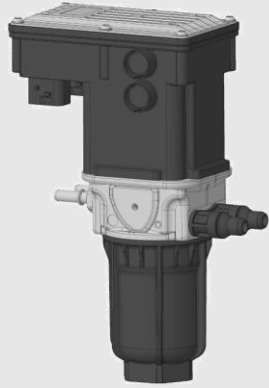
CPK Automotive
Systeme für eine saubere Zukunft

SCR Dosing System

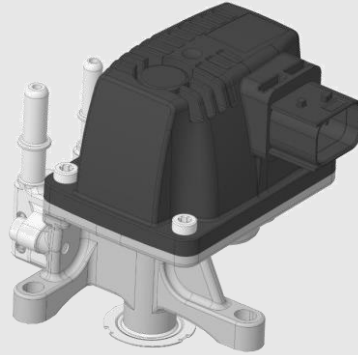


NO_x-Reduction by Ammonia (NH₃) under oxidising conditions

Scope of delivery SCR Dosing System



Supply unit



Dosing unit



SCR-Control unit



NO_x sensors



Manifold air pressure-
and temperatur sensor



Display

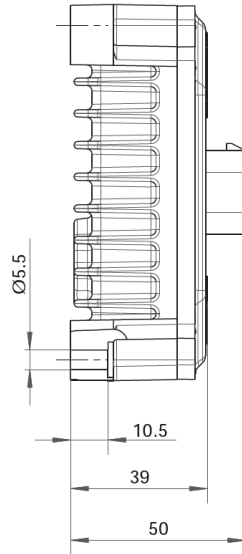
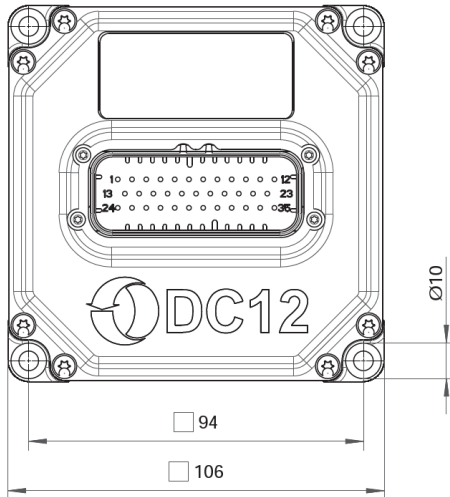


Exhaust gas temperature
sensors pre/post

SCR Control Unit



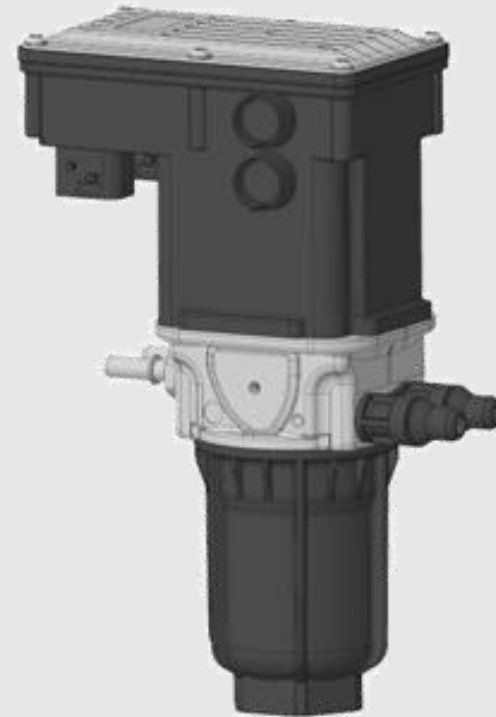
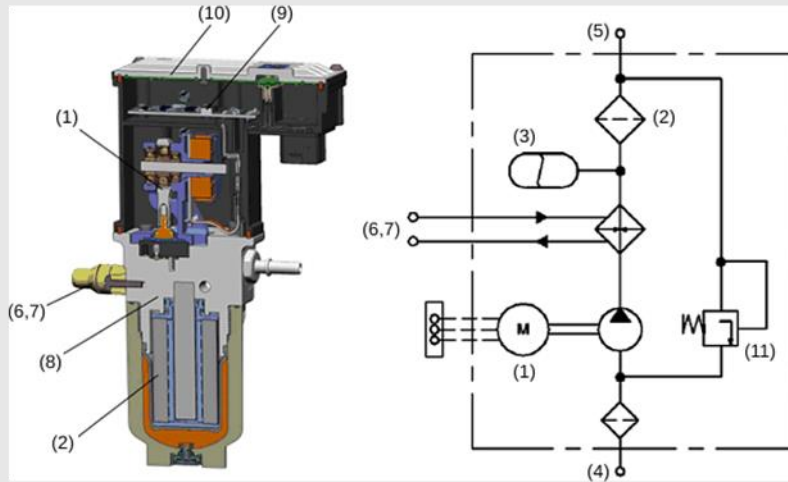
Compact SCR Control Unit as a key system component



General specification	
Supply voltage	7 ... 32VDC (nom. 24VDC)
Steady state current	< 0.2 A + actuator current consumption + sensor supplies
Protection grade	IP6K9K
Ambient temperature	-40 ... 80 °C
Storage temperature	-40 ... 105 °C
Permissible ambient humidity	< 98 % at 55 °C
Vibration	10 ... 20 Hz < 2 mm 21 ... 63 Hz < 0.24 m/s 64 ... 2000 < 9g

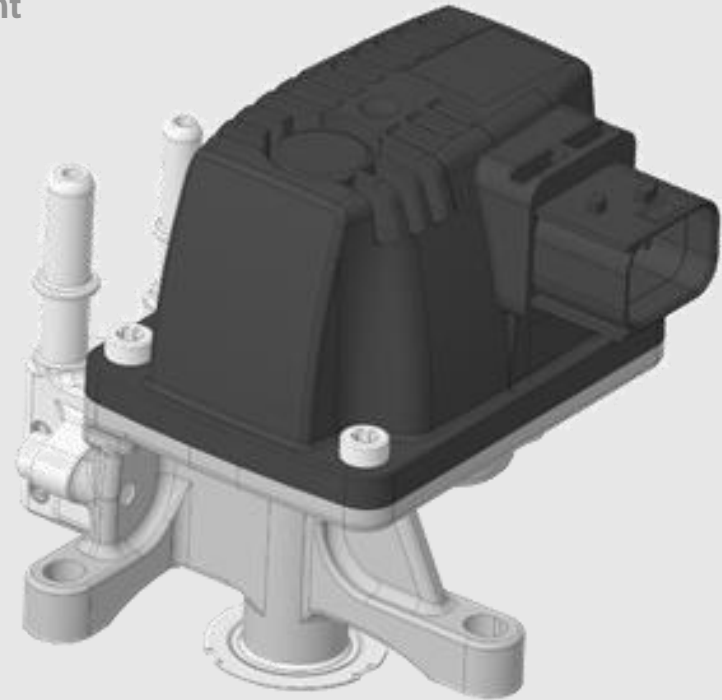
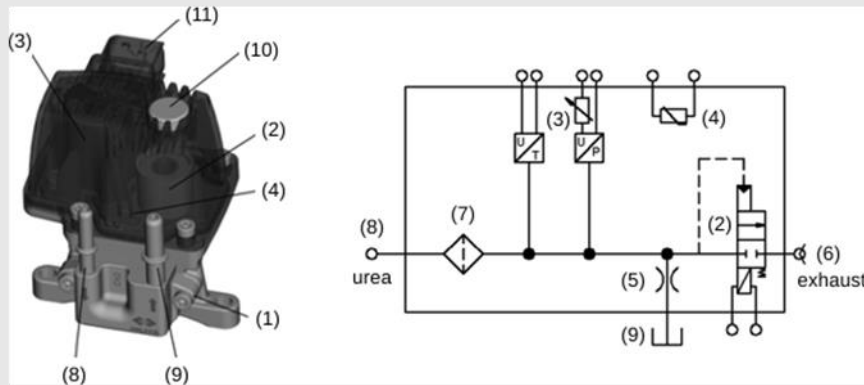
I/O specification	
Pickups	1× inductive, 0.5 ... 30 Vpp, 50 ... 9000 Hz 1× Hall type 10 ... 9000 Hz, PWM input or digital input applicable optional
Sensor supplies	2× 5 V < 50 mA each
Actuator output	4Q, 3.5 A continuous, 7 A for t < 20 s
Analogue inputs	3× analogue input 0 ... 5 V, assignable as binary inputs by parameter 2× temperature input, not insulated, Pt1000/NTC
Analogue outputs	1× analogue output 0 ... 5 V, 5 mA
Digital inputs	2× digital input, not insulated
Digital outputs	1× digital output low side 0.5 A, not insulated
Communication	1× CAN not insulated CAN protocol: HEINZMANN CAN protocol, CANopen, DeviceNet, SAE J1939 Other protocols on request
Configuration tool	HEINZMANN standard serial interface for HEINZMANN DcDesk
Wiring	Plug TYCO 35 pole

Compact SCR Supply Unit as a key system component



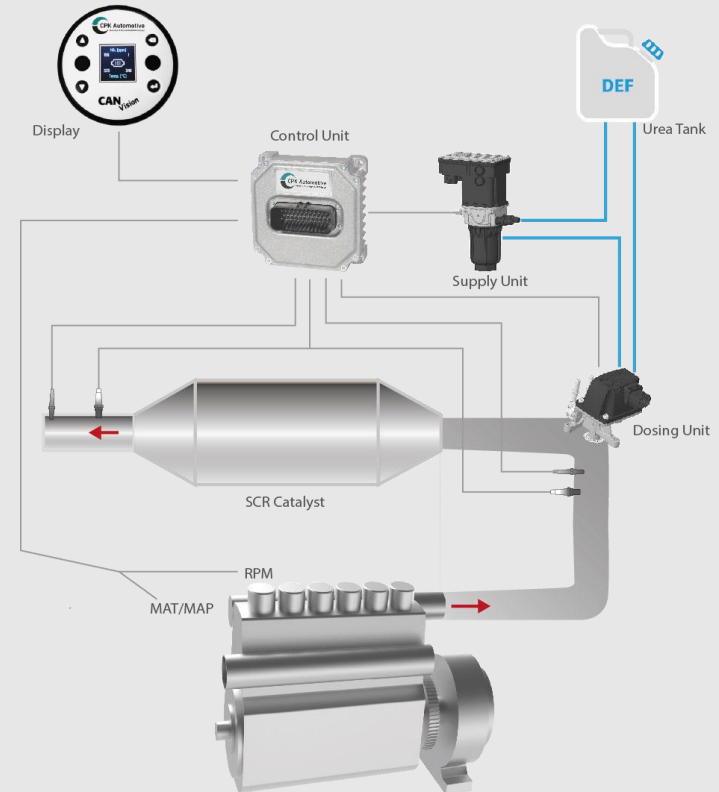
SCR Dosing Unit

Compact SCR Dosing Unit as a key system component



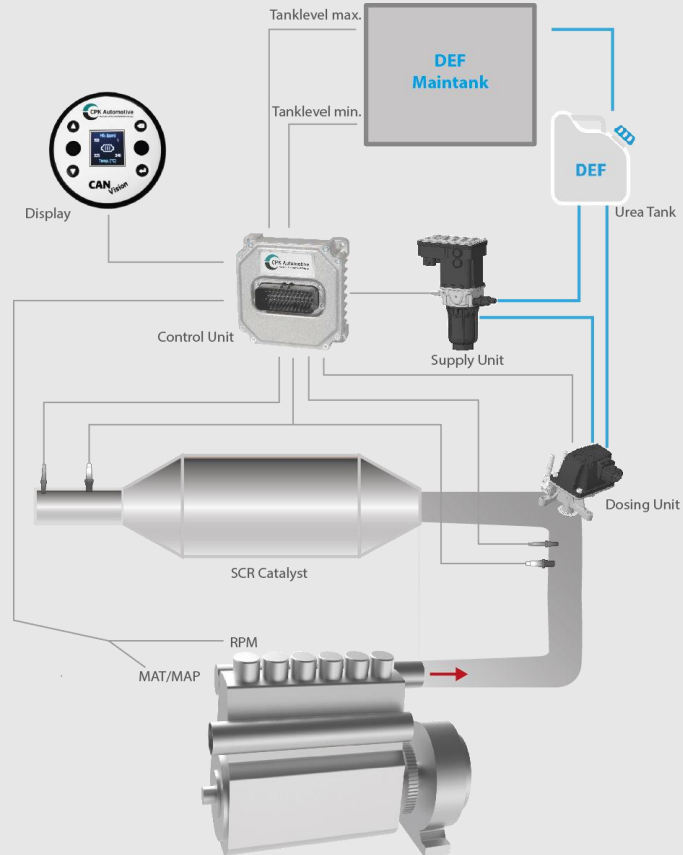
SCR Dosing System Layout I

- Closed loop control based on pre and post NOx concentrations
- Fully autarc, only necessary engine information: engine speed
- MAT/MAP Sensor provides air mass information
- Cummins Supply Unit and Dosing Unit, Type UL2, airless
- New digital Display CANVision



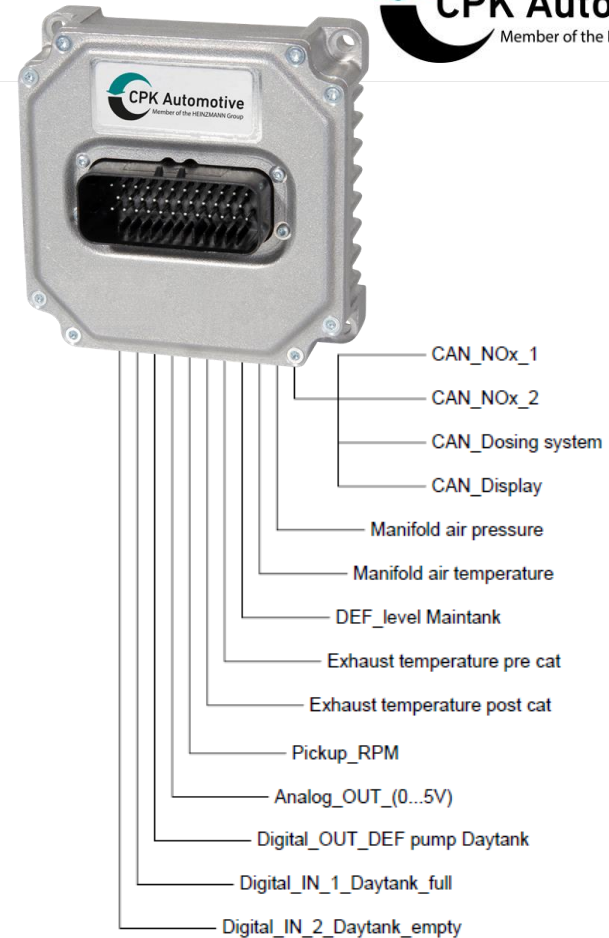
SCR Dosing System Layout II

- grey, el. wiring principle
- Blue, DEF/AdBlue hoses
- Additional functionality tank management
- System monitoring sensors and components



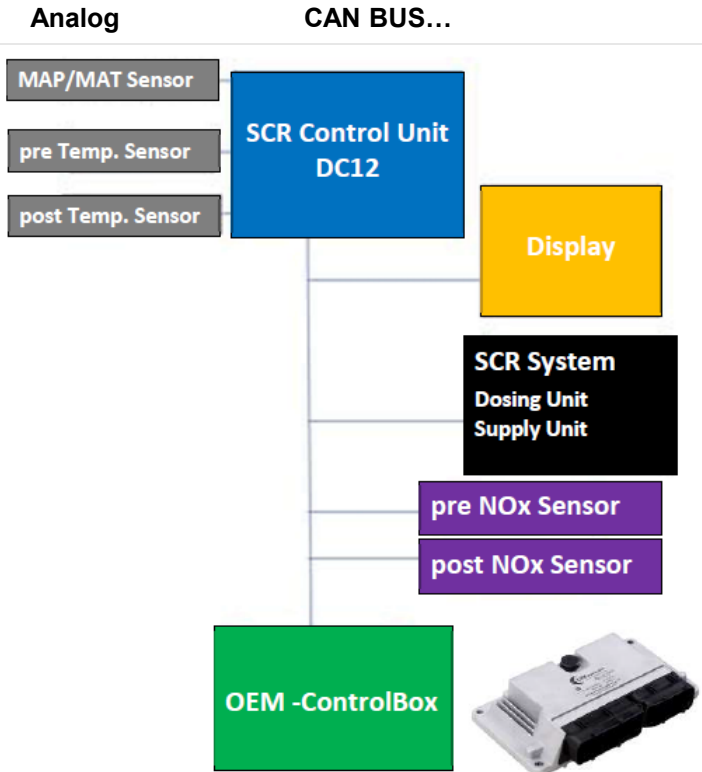
SCR Control Unit Interface

- CAN SAEJ1939
 - 2 NOx-sensors
 - Dosing system
 - Display
- Analog In-/Outputs
 - Manifold air pressure
 - DEF level maintank
 - Frequency Input for engine rpm
 - Analog Out (0...5V)
- Temperature Inputs
 - 2 Exhaust temperature sensors
 - Manifold air temperature
- Digital In-/Outputs
 - Daytank full
 - Daytank empty
 - DEF pump daytank
 - Frequency Input for engine rpm



OEM Control Box to monitor SCR CAN Data

Data flow CPK SCR Control Unit DC12 via CAN BUS



Available CAN Data

- AdBlue-pressure,
 - AdBlue-pump speed,
 - AdBlue quantity req.,
 - AdBlue quantity act.,
 - Dosing active (0,1),
 - Pump state (0,1),
 - NOx 1 (ppm),
 - NOx 2 (ppm),
 - O2 1 (%),
 - O2 2 (%).
-
- Exhaust temperature upstream catalyst,
 - exhaust temperature downstream catalyst,
 - NOx mass flow,
 - Intake mass flow,
 - Engine speed,
 - Manifold pressure,
 - Manifold temperature,
 - AdBlue level main tank,
 - AdBlue level day tank max.,
 - AdBlue level day tank min.,
 - Filling pump status (on/off).
 - NOx Setpoint
 - Delta NOx
 - Heater NOx Sensor 1&2 [On/Off]
 - NOx 1&2 Stable [Yes/No]
 - Date & Time
 - SW Version CB & Display
 - SN CB & Panel



Closed Loop Control

- Closed Loop Control for target NO_x concentration post SCR catalyst
-> system calculates the AdBlue dosing rate for a required NO_x reduction

Dosing based on a Load-Speed-Map

- Based on a given mapping (Load/Speed) an AdBlue dosing rate is applied

UL2 UREA DOSING SYSTEM SPECIFICATIONS

Technical Characteristics	Unit	UL2			Cummins Advantages
Dosing Rates (At 100% DC and 9 bar rel.)	Kg/hr	5.1	11.7	16.7	Greater flexibility
Dosing Accuracy (Reflects only the values at End of line (Okm). Lifetime values are different)	% error	+/- 3.5	+/- 5	+/- 7	Better reliability


Application Robustness	Unit	UL2			Cummins Advantages
Installation Angle	Relative to 0°	-135 to +135	-135 to +135	-135 to +135	Greater flexibility
Temperature Limit	DEF inlet (°C)	65	65	65	Easy to integrate
	Ambient (°C)	130	130	130	Easy to integrate
Vibration Capability		Specific customer profiles available like ISO 16750.3			Easy to integrate
Freeze Robustness	°C	-40	-40	-40	Better reliability
Purge Time	sec	0	0	0	Ease of operation
Injector Cooling		Urea cooled	Urea cooled	Urea cooled	Lower TCO
Urea Purging		Not required	Not required	Not required	Emission improvement
Injection Line Diameter (SM to DM)	mm	5-7.5	5-7.5	5-7.5	Greater flexibility
Doser Voltage	volt	12V and 24V	12V and 24V	12V and 24V	Greater flexibility
Screen/Filter	µm	Screen DU 31	Screen SU 190	Filter SU 30	Improved protection for DU failures



XIOS^{SCR} - dosing system for 36 kg/h urea


XIOS^{SCR} control unit (version X20-00-027-00)

Power supply:	24 V DC
Current consumption:	0,5 A nominal 25 A max (depending on peripheral components) 20 bar max.
Operating temperature:	-40...70°C
Analogue/temperature/digital inputs:	up to 20 (configurable)
Analogue/digital outputs	up to 4 (configurable)
Injector outputs	up to 2
Data logger	up to 10 data sets (max. 10 values each)
CAN bus	up to 2
Ethernet	up to 2




Urea pump

Power supply:	24 V DC
Current consumption:	2 A nominal 7 A start
Flow rate:	40 kg/h max.
Pressure:	7 bar nominal 20 bar max.
Operating temperature:	-20...65°C
Suction lift:	1 m
Transfer length (to injector):	6 m
Transfer height (to injector):	1,5 m




Urea injector

Current consumption:	1 A nominal 5 A max.
Dosing rate:	36 kg/h max.
Pressure:	5...7 bar nominal
Operating temperature:	0...125°C
Max. height of tank to injector:	2,5 m
Separate pressure sensor:	0...10 bar




NO_x sensor

Power supply:	24 V DC
Current consumption:	1,0 A nominal 20 A max.
NO _x measuring range:	0...1500 ppm
O ₂ measuring range:	0...20,9 %
Exhaust temperature range:	-40...800°C
Sensor control unit temp. range:	-40...100°C



Exhaust temperature sensor

Sensor type:	Pt200
Sensor length:	110 mm
Exhaust temperature range:	-40...700°C
Sensor cable temp. range:	-40...260°C



Differential pressure sensor

Power supply:	5 V DC
Operating temperature:	0...100°C
Differential pressure:	0...95 mbar



SCR System Retrofit, Palm oil GenSet, Volvo Penta



SCR System Retrofit, Palm oil GenSet, Volvo Penta

SCR Dosing Unit



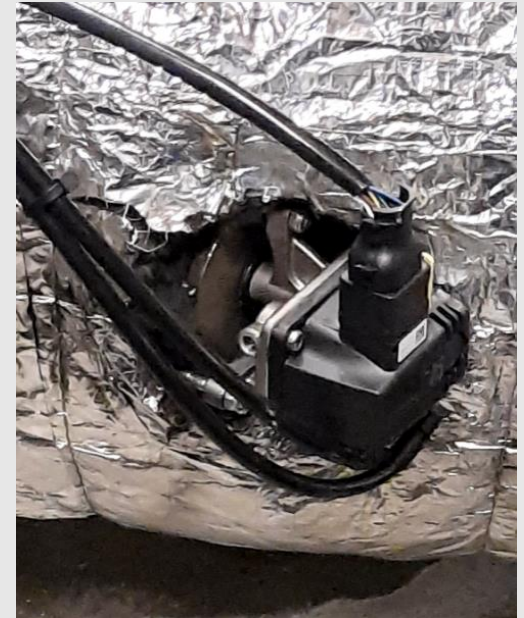
SCR Kat



SCR Control und Supply Unit



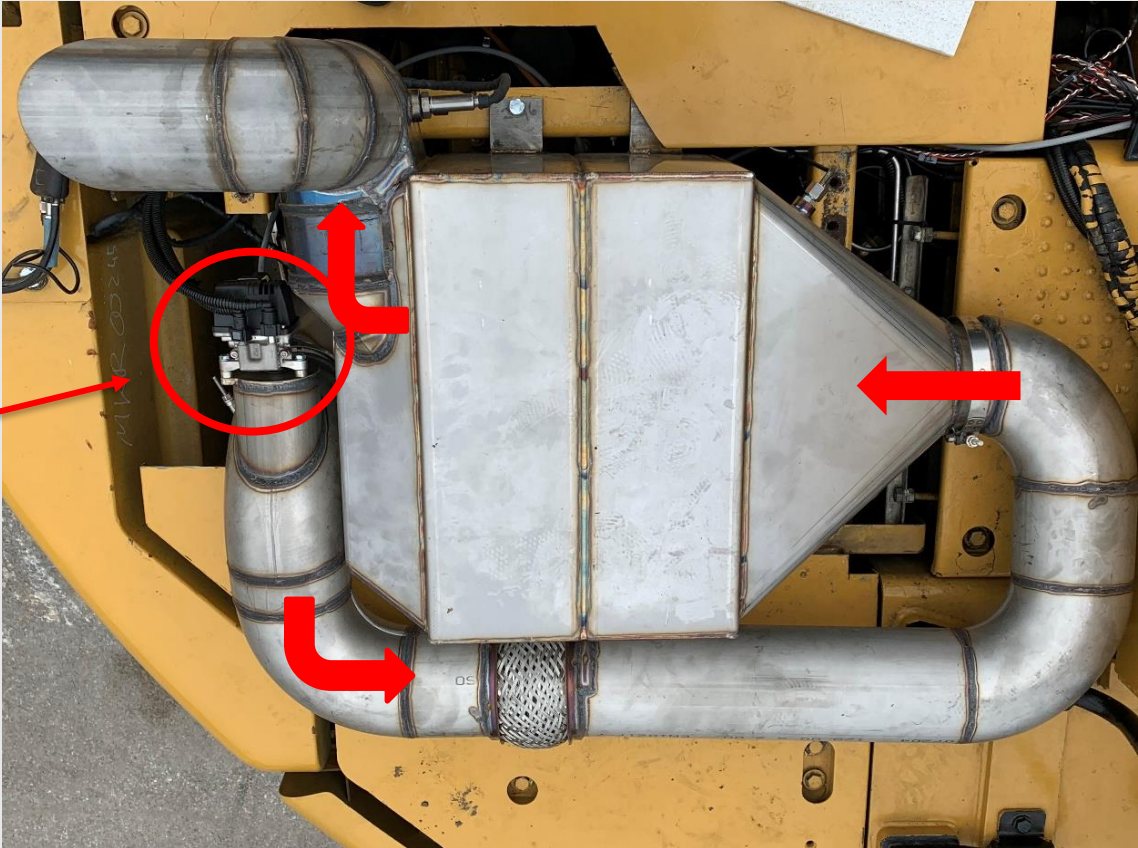
SCR Dosing Unit



SCR System Retrofit on a CAT Excavator 328D



SCR System Retrofit on a CAT Excavator 328D



SCR Dosing Unit

SCR System Retrofit on a CAT Excavator 328D

SCR Control & Supply Unit



SCR Dosing Unit

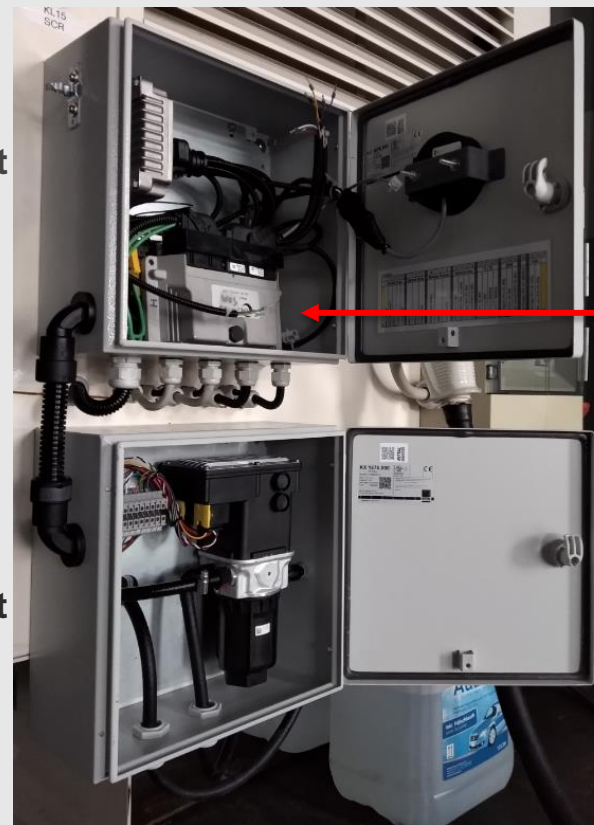


SCR Dosier System, Cabinet
30 x 30 cm cabinet, above electronics, below Supply Unit (DEF fluid)



SCR Control Unit

SCR Supply Unit



**Extension:
Data logging**

CPK Automotive GmbH & Co. KG

Gildenstr. 4c
48157 Münster (Germany)

info@cpk-automotive.com
www.cpk-automotive.com