Cummins Emission Solutions

UL2 Urea Dosing System.

Cummins Emission Solutions is a leading global aftertreatment and engineered component supplier that provides the highest level of technology to support and meet the constantly evolving emissions standards for the on- and off-highway transportation markets. Cummins Emission Solutions offers a variety of proven solutions to best fit your needs, from fully integrated aftertreatment systems to individual system components.

UL2 Urea Dosing System.

Cummins Emission Solutions newest product addition to its urea doser portfolio is the UL2 Urea Dosing System. This liquid-only dosing system helps reduce oxides of nitrogen (NOx) in both low-flow and high-flow Selective Catalytic Reduction (SCR) systems. The UL2 system is the only liquid-only dosing system commercially available that is capable of meeting high-flow dosing rates of up to 20.5 kg/hr.

Supply Unit.

- Mounts to the chassis
- Heated by engine coolant
- Enhanced freeze-resistant components
- Contains optional integrated dosing controls to monitor injector, temperature and pressure sensors

Dosing Unit.

- Mounts to the decomposition reactor
- Cooled by urea recirculation; heated by electricity
- Contains proprietary pressure-swirl atomizer with reinforced 11-layer nozzle
- Enhanced freeze-resistant components
- Contains injector, temperature and pressure sensors

Flexibility And Ease Of Integration.

The UL2 system has a unique fluid recirculation system that allows the injector to be cooled by urea. Our system maintains its specified temperature range by using a cooler medium instead of traditional methods that use engine coolant. The benefits of this unique design include:

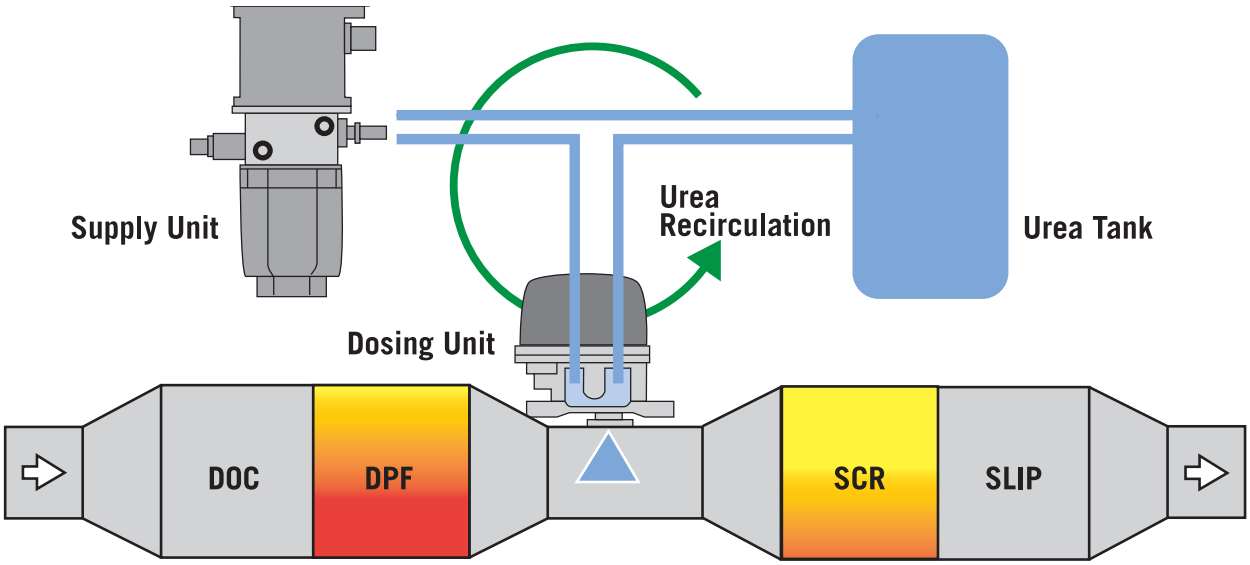
- Elimination of two cooling lines to the dosing unit, and the addition of only one urea line, reducing complexity of integration
- Optional circulated urea at key-off to counteract heat soak from the exhaust system, improving system reliability
- Automatic depressurization at system shutdown, adding proven reliability in freeze resistance

The UL2 system can accommodate varying dosing line lengths, allowing the distance between the supply and dosing unit to be chosen more freely, without affecting controls technology. The benefits of this modular design include:

- Extended urea transfer line lengths of up to 15 meters, with no extra adaptation of the application parameters required
- The ability to apply dosing units in multiples for high-horsepower engine applications

Furthering this system's flexibility in vehicle integration, the supply unit has the option of controls technology via the electronic dosing unit. This technology offers the following built-in capabilities:

- Supply unit pump control
- Dosing unit injector control
- Heating control
- Pressure and temperature sensor controls
- Diagnostic and handling controls
- Heating element control



Designed For Freeze-Robustness.

The UL2 is the only liquid-only dosing system in the market offering freeze-robustness in its design, and improved reliability, as urea is continually present within the unit to prevent doser crystallization and clogging. The benefits of this technology include:

- Eliminating the need for power after key-off, providing freeze-robustness
- Quicker dosing readiness at key-on; avoids priming issues with pump, as no purging is necessary
- Quicker NOx treatment and prevention of crystallization, as urea is always present in system
- Prevents system damage during intentional or unintentional interruption of power to the vehicle

Innovative Technology To Enhance Performance.

The proprietary design of the UL2 system offers many features that optimize dosing spray performance. This reduces deposit formations and enhances mixing capabilities to significantly improve reliability. The benefits of our technology include:

- A pressure-swirl atomizer, which offers customized spray angles and flow rates
- Reduction of droplet size to as low as 24 microns SMD, promoting improved NOx conversion efficiency
- A diverter valve for high-horsepower usage, which diverts pressure to allow more urea to be released for high-flow optimization

Eliminating Urea Challenges.

The UL2 system has been designed to withstand and overcome many urea challenges that other competitive systems cannot tolerate during the dosing process. Our superior system has successfully undergone urea compatibility testing to:

- Use potted electrical components to prevent infiltration
- Utilize static-only sealing to avoid urea leakages and short circuits
- Prevent crystallization by continually keeping urea present within the unit

UL2 Urea Dosing System Specifications.

Technical Characteristics	Unit	UL2			Cummins Advantages
Dosing Rates	Kg/hr	5	11.7	20	Greater flexibility
Spray Characteristics	SMD	30	31	41	Emission improvement
	Dv90	85	88	208	Better reliability
	Cone angle degree	42	50	88	Emission improvement
Dosing Accuracy	% 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
Pump Head Height	Relative height of tank to dosing unit (m)	4.4	4.4	4.4	Greater flexibility
Temperature Limit	DEF inlet (°C)	65	65	65	Easy to integrate
	Ambient (°C)	130	130	130	Easy to integrate
Vibration Capability		ISO16750.3	ISO16750.3	ISO16750.3	Easy to integrate
Contamination Robustness	um	100	100	100	Better reliability
Filter Capacity	g	4	4	4	Greater capacity
Freeze Robustness	°C	-40	-40	-40	Better reliability
Purge Time	sec	0	0	0	Ease of operation
Useful Life	hr	24,000	24,000	24,000	Better reliability
Injector Cooling		Urea cooled	Urea cooled	Urea cooled	Lower TCO
Urea Purging		Not required	Not required	Not required	Emission improvement
Injection Line Length (SM to DM)	meter	<15	<15	<15	Greater flexibility
Injection Line Dia. (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

Cummins Emission Solutions
301 Jackson Street
Columbus, IN 47201
U.S.A.

Phone: 1-800-DIESELS™ (1-800-343-7357)
Internet: cumminsemissionsolutions.com

Bulletin 4973783 Printed in U.S.A. Rev. 3/16