Summary of Atos ex-proof components certified to cULus

Atos cULus ex-proof components are electrohydraulic equipment for industrial and mobile applications, designed to operate in hazardous environments in presence of flammable liquids, gases, vapors or combustible dust.

They are certified by **UL** Underwriters Laboratories in conformity to **UL 1203, UL429, CSA C22.2** and relevant **NEC** standards.

1 PRODUCTS RANGE

Atos cULus certified ex-proof components range includes proportional valves and on-off valves.
The **UL** certification covers all electrical parts of solenoids and LVDT transducers.
These components are engineered and manufactured according to protection method **Ex d**, where internal parts are sealed inside a ruggedized **flameproof enclosure**, granting high protection to the risk of explosion, see section 2

The mechanical parts likes body, spools, etc, are strictly derived from highly engineered standard components.
They are not involved in the certification since their functioning does not represent a potential risk for the explosive environment.

Product Category	Component	Driver	Environment	cULus certification		Marking
				NEC 500	NEC 505	
Proportional valves	Servoproportional directionals High preformance directionals Directional valves High performance pressure valves Pressure valves Flow valves	off-board	Gas	Class I Division I Groups C & D	Class I Zone 1 Groups IIA & IIB	see sect. 4
On-off valves	Directional valves Pressure relief valves	-	Gas			see sect. 5

2 FLAMEPROOF ENCLOSURE - Ex d

Technical characteristics

It is characterized by a strong mechanical construction, capable of withstanding the overpressure caused by a potential internal explosion and preventing the spread of flames to the external environment. It permits to dissipate the heat generated by the solenoid in order to limit the surface temperature within certified classes (T6, T5, etc), to avoid the self-ignition of the surrounding flammable atmosphere.
The rugged design of the flameproof enclosure makes the ex-proof valves suited for application in harsh environments.

Electrical wiring

The electrical wiring to the terminal board of ex-proof solenoids and LVDT transducers must be performed using **UL** certified cable glands, or conduit pipe.
Electric cables must be **UL** approved for the specific temperature class reported on the ex-proof component's nameplate, refer to specific tech. table of ex-proof valves for cable temperature.

3 NAMEPLATE MARKING

Atos cULus certified ex-proof components are provided with a specific nameplate reporting the **UL** certificate number and the classification according to the relevant **NEC 500** and **NEC 505** standards.
The classification identifies the compatibility of the ex-proof component for a specific hazardous environment.
The following sections provide a detailed description of the nameplate marking for proportional and on-off valves.

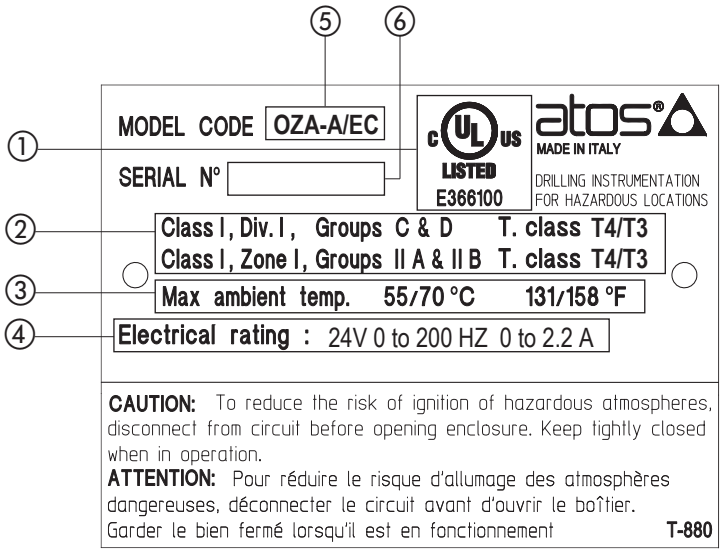
3.1 cULus Listed logo

This type of UL logo indicates compliance with both Canadian and U.S. requirements.
Atos ex-proof components are marked with **cULus Listed** logo stating that they have been investigated by UL Underwriters laboratory in accordance with following standards:

-**UL 1203** Standard for Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for use in Hazardous (classified) locations
-**UL 429** Standard for Electrically Operated valves
-**CSA C22.2 No. 139-13** Electrically Operated Valves

Solenoid nameplate marking to NEC 500 and NEC 505

Class I, Division I, Groups C & D
Class I, Zone 1, Groups IIA & IIB



① cULus marking and certificate number
② Marking according to NEC 500 and NEC 505 standards
③ Ambient temperature
④ Power supply characteristics
⑤ Solenoid model code
⑥ Solenoid serial number

NEC 500 classification

Class I	Division I	Groups C & D	T4/T3
Class I Equipment for flamable Gas and Vapors	**Division I** Explosive substances continuosly or intermittently present in the atmosphere	**Gas Group** **C** Methane, Butane, Petrol, etc. **D** Ethylene, Formaldehyde, Cloruprophane, etc.	**Temperature Class** **T4** ≤ 135°C **T3** ≤ 200°C

NEC 505 classification

Class I	Zone 1	Groups IIA & IIB	T4/T3
Class I Equipment for flamable Gas and Vapors	**Zone 1** Location where explosive substance are continuosly present	**Gas Group** **IIA** Methane, Butane, Petrol, etc. **IIB** Ethylene, Formaldehyde, Cloruprophane, etc.	**Temperature Class** **T4** ≤ 135°C **T3** ≤ 200°C

RELATED DOCUMENTATION

Servoproportional directional - zero overlap with LVDT transducer
FX140 DLHZA/UL-T DLKZA/UL-T - direct, sleeve execution

High performance directional - positive overlap with LVDT transducer
FX120 DHZA/UL-T, DKZA/UL-T - direct

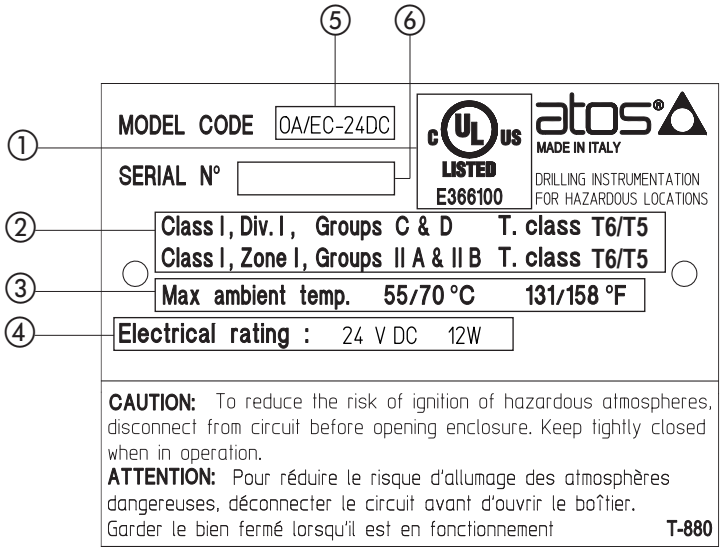
Directional valves - positive overlap without transducer
FX100 DHZA/UL-A, DKZA/UL-A - direct
FX200 DPZA/UL-A - piloted

Pressure valves - without pressure transducer
FX010 RZMA/UL-A, HZMA/UL-A, AGMZA/UL-A - relief
FX040 RZGA/UL-A, AGRCZA/UL-A, HZGA/UL-A, KZGA/UL-A - reducing
FX070 DHRZA/UL-A - reducing
FX300 LIMZA/UL-A - relief
LIRZA/UL-A - reducing
LICZA/UL-A - compensator

Flow valves, pressure compensated
FX420 QVHZA/UL-T, QVKZA/UL-T - with LVDT transducer
FX400 QVHZA/UL-A, QVKZA/UL-A - without transducer

Solenoid nameplate marking to NEC 500 and NEC 505

Class I, Division I, Groups C & D
Class I, Zone 1, Groups IIA & IIB



① cULus marking and certificate number
② Marking according to NEC 500 and NEC 505 standards
③ Ambient temperature
④ Power supply characteristics
⑤ Solenoid model code
⑥ Solenoid serial number

NEC 500 classification

Class I	Division I	Groups C & D	T6/T5
Class I Equipment for flamable Gas and Vapors	**Division I** Explosive substances continuosly or intermittently present in the atmosphere	**Gas Group** **C** Methane, Butane, Petrol, etc. **D** Ethylene, Formaldehyde, Cloruprophane, etc.	**Temperature Class** **T6** ≤ 85°C **T5** ≤ 100°C

NEC 505 classification

Class I	Zone 1	Groups IIA & IIB	T6/T5
Class I Equipment for flamable Gas and Vapors	**Zone 1** Location where explosive substance are continuosly present	**Gas Group** **IIA** Methane, Butane, Petrol, etc. **IIB** Ethylene, Formaldehyde, Cloruprophane, etc.	**Temperature Class** **T6** ≤ 85°C **T5** ≤ 100°C

RELATED DOCUMENTATION

Directional valves

EX010 DHA/UL - direct, spool type
EX020 DLAH/UL, DLAHM/UL - direct, poppet type
CART-LAH/UL, CART-LAHM/UL - cartridge screw-in, direct, poppet type
EX030 DPHA/UL – piloted, spool type
EX050 LIDEW-AO/UL, LIDBH-AO/UL - piloted ISO cartridges and functional covers

Pressure relief valves

CX010 AGAM-AO/UL, ARAM-AO/UL - piloted, with solenoid valve for venting