

Summary of Atos ex-proof components

multicertified to **ATEX**, **IECEX**, **EAC**, **PESO**, **CCC**



Atos 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 independent notified bodies in conformity to **ATEX**, **IECEX**, **EAC**, **PESO** and **CCC** standards.

1 PRODUCTS RANGE

1.1 PROPORTIONAL and ON-OFF VALVES

The certification for proportional and on-off valves is relevant to solenoids, on-board electronic drivers and transducers.

These components are engineered and manufactured according to protection method **Ex-d** (code **Ex-t** for dust environments), 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	Multicertification					Marking
				ATEX	IECEX	EAC	PESO	CCC	
Proportional valves	Servoproportional directionals	on-board	Gas & Dust	X	X			X	see sect. 4
	High preformance directionals	off-board	Gas & Dust	X	X	X	X (only Gas)	X	see sect. 5
	Directional valves		Mining	X	X				see sect. 7
	High performance pressure valves								
Axis controls	Servoproportional directionals	on-board	Gas & Dust	X	X			X	see sect. 4
On-off valves	Directional valves	-	Gas & Dust	X	X	X	X (only Gas)	X	see sect. 6
	Pressure relief valves		Mining	X	X				see sect. 8

1.2 PUMPS and CYLINDERS

Hydraulic components without electrical parts are also subject to the requirements of ATEX Directive 2014/34/EU, but the certification is not mandatory (it can be performed on voluntary basis).

PVPCA variable displacement axial piston pumps, PFEA fixed displacement vane pumps and CKA hydraulic cylinders, are ATEX certified to **Ex-h** protection. The protection method Ex-h combines the characteristics of construction safety (Ex-c), control of ignition source (Ex-b) and protection by liquid immersion (Ex-k)

Product Category	Component	Environment	Certification	Marking
Pumps	PVPCA - variable displacement piston pumps PFEA - fixed displacement vane pumps	Gas & Dust	ATEX	see sect. 9
Cylinder	CKA - hydraulic cylinders CKAM - hydraulic servocylinders	Gas & Dust	ATEX	see sect. 10

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 and driver power, 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, combined with IP66/67 ingress protection, makes the ex-proof valves suited for application in harsh environments.

Electrical wiring

The electrical wiring to the terminal board of ex-proof solenoids, on-board digital drivers and transducers must be performed using ex-proof certified cable glands, see tech. table KX600.

Electric cables must be 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

The ex-proof certified components are provided with a specific nameplate reporting the certificate number, the notified body and the classification according to the relevant certification.

The classification identifies the protection method and the compatibility of the ex-proof component for a specific hazardous environment.

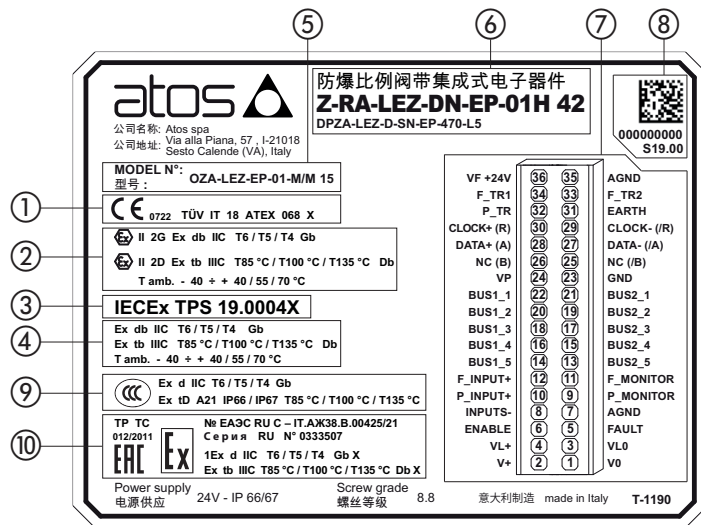
The following sections provide a detailed description of the nameplate marking for component categories.

4 PROPORTIONAL VALVES WITH ON-BOARD DIGITAL DRIVER / AXIS CONTROLLER

Driver nameplate marking to ATEX and IECEx

Gas - group II 2G - Zone 1, 2
Dust - group II 2D - Zone 21, 22

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ IECEx notified body and certificate number
- ④ Marking according to IECEx Scheme
- ⑤ Code of solenoid
- ⑥ Code of on-board driver and related proportional valve
- ⑦ Electronic connections
- ⑧ Qr code and driver serial number
- ⑨ Marking according to CCC certification
- ⑩ Marking according to EAC certification



ATEX / IECEx classification - for Gas group II

II 2 G	Ex	db	IIC	T6/T5/T4	Gb
Equipment Group II industrial Equipment Category 2 High Protection Suitable for use G Gas	Mark of Explosion Proof	Protection Method db Flameproof enclosure	Gas Group IIC Hydrogen & Acetylene	Temperature Class T6 ≤ 85°C T5 ≤ 100°C T4 ≤ 135°C	Equipment Protection Level Gb High protection (Gas, Zone1)

ATEX / IECEx classification - for Dust

II 2 D	Ex	tb	IIIC	T85/T100/T135	Db
Equipment Group II industrial Equipment Category 2 High Protection Suitable for use D Dust	Mark of Explosion Proof	Protection Method tb Protection by enclosure	Dust Group IIIC Conductive Dust	Temperature Class T85 ≤ 85°C T100 ≤ 100°C T135 ≤ 135°C	Equipment Protection Level Db High protection (Dust, Zone21)

RELATED DOCUMENTATION

Servoproportional directional - zero overlap with LVDT transducer FX150 DLHZA-TES, DLKZA-TES - direct, sleeve execution FX135 DHZA-TES, DKZA-TES - direct FX235 DPZA-LES, piloted FX380 LIQZA-LES, 3-way cartridge High performance directional - positive overlap with LVDT transducer FX130 DHZA-TES, DKZA-TES - direct FX230 DPZA-LES - piloted FX360 LIQZA-LES, 2-way cartridge Directional valves - positive overlap without transducer FX110 DHZA-AES, DKZA-AES - direct FX210 DPZA-AES - piloted High performance pressure valves - with pressure transducer FX030 RZMA-RES, AGMZA-RES - relief FX060 RZGA-RES, AGRCZA-RES - reducing FX320 LIMZA-RES, LIRZA-RES, LICZA-RES - relief, reducing, compensator	Pressure valves - without transducer FX020 RZMA-AES, AGMZA-AES - relief FX050 RZGA-AES, AGRCZA-AES - reducing FX080 DHRZA-AES - reducing FX310 LIMZA-AES - relief LIRZA-AES - reducing LICZA-AES - compensator Flow valves, pressure compensated FX430 QVHZA-TES, QVKZA-TES - with LVDT transducer FX410 QVHZA-AES, QVKZA-AES - without transducer Servoproportional valves with on-board axis controller FX610 DLHZA-TEZ, DLKZA-TEZ - direct, sleeve execution FX620 DHZA-TEZ, DKZA-TEZ - direct FX630 DPZA-LEZ - piloted
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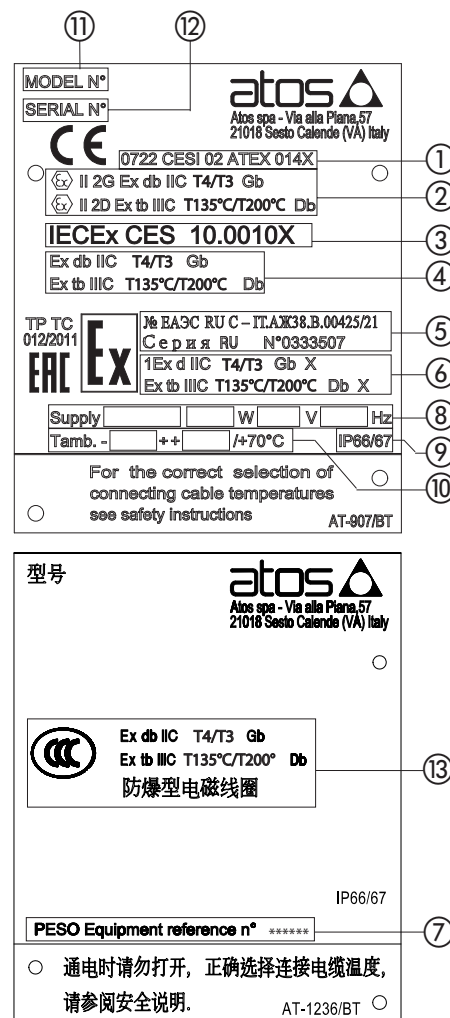
5 PROPORTIONAL VALVES WITH OFF-BOARD DIGITAL DRIVER

Solenoid nameplate marking to ATEX, IECEx, EAC, CCC and PESO

Gas - group II 2G - Zone 1, 2

Dust - group II 2D - Zone 21, 22

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ IECEx notified body and certificate number
- ④ Marking according to IECEx Scheme
- ⑤ EAC notified body and certificate number
- ⑥ Marking according to EAC
- ⑦ PESO certificate number
- ⑧ Power supply characteristics
- ⑨ Ingress protection:
 - IP66 = no dust ingress, protection against heaving seas or powerful jets of water
 - IP67 = no dust ingress, protection to water immersion
- ⑩ Ambient temperature
- ⑪ Solenoid model code
- ⑫ Solenoid serial number
- ⑬ Marking according to CCC certification



ATEX / IECEx / EAC / PESO classification - for Gas group II

II 2 G	Ex	db	IIC	T4 / T3	Gb
Equipment Group II industrial Equipment Category 2 High Protection Suitable for use G Gas	Mark of Explosion Proof	Protection Method db Flameproof enclosure	Gas Group IIC Hydrogen & Acetylene	Temperature Class T4 ≤ 135°C T3 ≤ 200°C	Equipment Protection Level Gb High protection (Gas, Zone1)

ATEX / IECEx / EAC classification - for Dust

II 2 D	Ex	tb	IIIC	T135 / T200	Db
Equipment Group II industrial Equipment Category 2 High Protection Suitable for use D Dust	Mark of Explosion Proof	Protection Method tb Protection by enclosure	Dust Group IIIC Conductive Dust	Temperature Class T85 ≤ 135°C T135 ≤ 200°C	Equipment Protection Level Db High protection (Dust, Zone21)

RELATED DOCUMENTATION

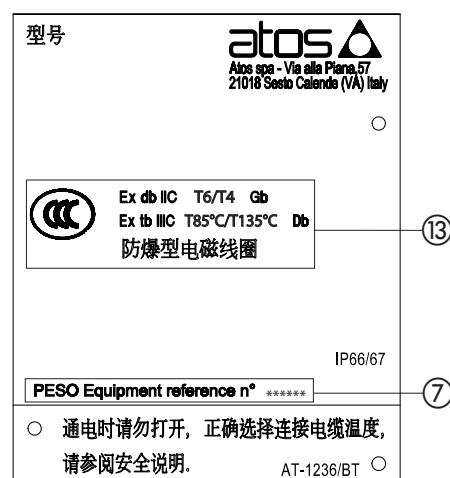
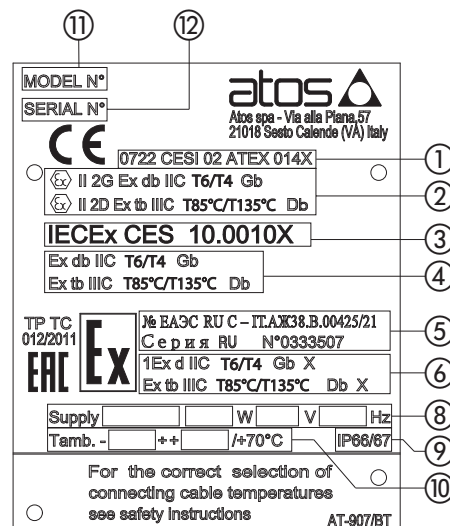
Servoproportional directional - zero overlap with LVDT transducer FX140 DLHZA-T, DLKZA-T - direct, sleeve execution FX370 LIQZA-L, 3-way cartridge High performance directional - positive overlap with LVDT transducer FX120 DHZA-T, DKZA-T - direct FX220 DPZA-T - piloted FX350 LIQZA-L, 2-way cartridge Directional valves - positive overlap without transducer FX100 DHZA-A, DKZA-A - direct FX200 DPZA-A - piloted	Pressure valves - without pressure transducer FX010 RZMA-A, HZMA-A, AGMZA-A - relief FX040 RZGA-A, AGRCZA-A, HZGA-A, KZGA-A - reducing FX070 DHRZA-A - reducing FX300 LIMZA-A - relief LIRZA-A - reducing LICZA-A - compensator Flow valves, pressure compensated FX420 QVHZA-T, QVKZA-T - with LVDT transducer FX400 QVHZA-A, QVKZA-A - without transducer
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6 ON-OFF VALVES

Nameplate marking to ATEX, IECEx, EAC, CCC and PESO

Gas - group II 2G - Zone 1, 2
Dust - group II 2D - Zone 21, 22

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ IECEx notified body and certificate number
- ④ Marking according to IECEx Scheme
- ⑤ EAC notified body and certificate number
- ⑥ Marking according to EAC
- ⑦ PESO certificate number
- ⑧ Power supply characteristics
- ⑨ Ingress protection:
 - IP66 = no dust ingress, protection against heaving seas or powerful jets of water
 - IP67 = no dust ingress, protection to water immersion
- ⑩ Ambient temperature
- ⑪ Solenoid model code
- ⑫ Solenoid serial number
- ⑬ Marking according to CCC certification



ATEX / IECEx / EAC / PESO classification - for Gas group II

II 2 G	Ex	db	IIC	T6 / T4	Gb
Equipment Group II industrial Equipment Category 2 High Protection Suitable for use G Gas	Mark of Explosion Proof	Protection Method db Flameproof enclosure	Gas Group IIC Hydrogen & Acetylene	Temperature Class T6 ≤ 85°C T4 ≤ 135°C	Equipment Protection Level Gb High protection (Gas, Zone1)

ATEX / IECEx / EAC classification - for Dust

II 2 D	Ex	tb	IIIC	T85 / T135	Db
Equipment Group II industrial Equipment Category 2 High Protection Suitable for use D Dust	Mark of Explosion Proof	Protection Method tb Protection by enclosure	Dust Group IIIC Conductive Dust	Temperature Class T85 ≤ 85°C T135 ≤ 135°C	Equipment Protection Level Db High protection (Dust, Zone21)

RELATED DOCUMENTATION

Directional valves

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

Pressure relief valves

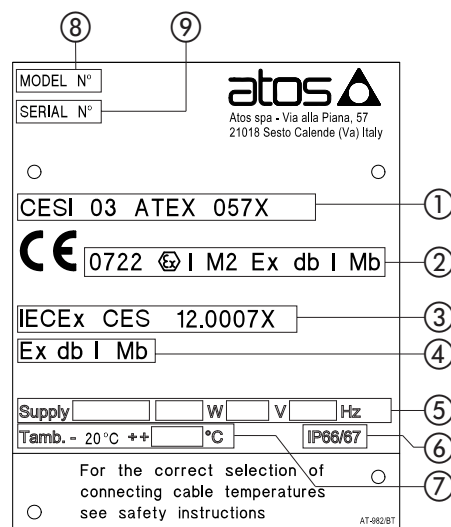
- CX010** AGAM-AO, ARAM-AO - piloted, with solenoid valve for venting

7 PROPORTIONAL VALVES WITH OFF-BOARD DIGITAL DRIVER

Nameplate marking to ATEX and IECEx

Gas - group I M2 - Mining

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ IECEx notified body and certificate number
- ④ Marking according to IECEx Scheme
- ⑤ Power supply characteristics
- ⑥ Ingress protection:
 - IP66 = no dust ingress, protection against heaving seas or powerful jets of water
 - IP67 = no dust ingress, protection to water immersion
- ⑦ Ambient temperature
- ⑧ Solenoid model code
- ⑨ Solenoid serial number



ATEX, IECEx classification - for Gas group I - Mining

I M2	Ex	db	I	Mb
Equipment Group I mines Equipment Category M2 High Protection	Mark of Explosion Proof	Protection Method db Flameproof enclosure	Gas Group I Methane	Equipment Protection Level Mb High protection (de-energized with gas presence)

RELATED DOCUMENTATION

Servoproportional directional - zero overlap with LVDT transducer

FX140 DLHZA/M-T DLKZA/M-T – direct, sleeve execution

High performance directional - positive overlap with LVDT transducer

FX120 DHZA/M-T, DKZA/M-T – direct

Directional valves - positive overlap without transducer

FX100 DHZA/M-A, DKZA/M-A - direct

FX200 DPZA/M-A - piloted

Pressure valves - without pressure transducer

FX010 RZMA/M-A, HZMA/M-A, AGMZA/M-A - relief

FX040 RZGA/M-A, AGRCZA/M-A, HZGA/M-A, KZGA/M-A - reducing

FX070 DHRZA/M-A - reducing

FX300 LIMZA/M-A - relief

LIRZA/M-A - reducing

LICZA/M-A - compensator

Flow valves, pressure compensated

FX420 QVHZA/M-T, QVKZA/M-T - with LVDT transducer

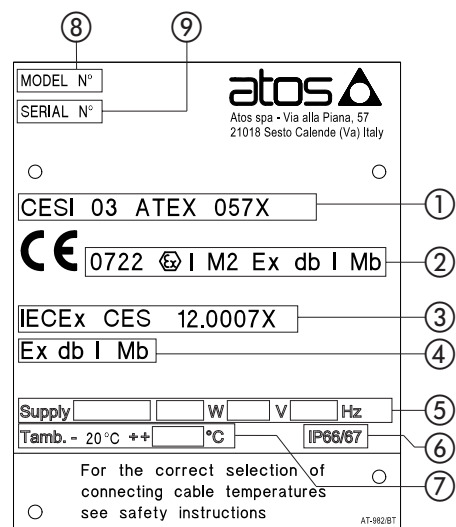
FX400 QVHZA/M-A, QVKZA/M-A - without transducer

8 ON-OFF VALVES

Nameplate marking to ATEX and IECEx

Gas - group I M2 - Mining

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ IECEx notified body and certificate number
- ④ Marking according to IECEx Scheme
- ⑤ Power supply characteristics
- ⑥ Ingress protection:
 - IP66 = no dust ingress, protection against heaving seas or powerful jets of water
 - IP67 = no dust ingress, protection to water immersion
- ⑦ Ambient temperature
- ⑧ Solenoid model code
- ⑨ Solenoid serial number



ATEX, IECEx classification - for Gas group I - Mining

I M2	Ex	db	I	Mb
Equipment Group I mines Equipment Category M2 High Protection	Mark of Explosion Proof	Protection Method db Flameproof enclosure	Gas Group I Methane	Equipment Protection Level Mb High protection (de-energized with gas presence)

RELATED DOCUMENTATION

Directional valves

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

Pressure relief valves

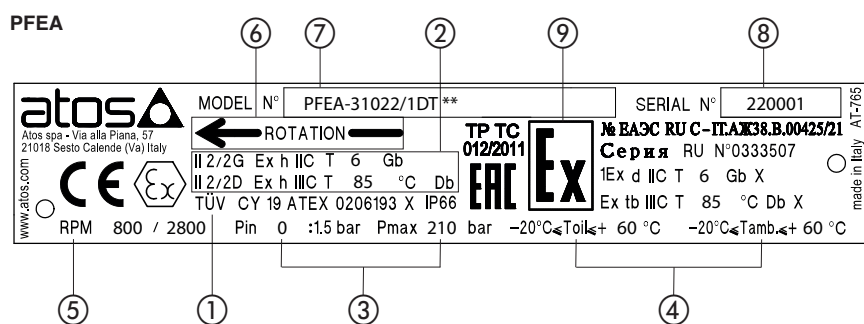
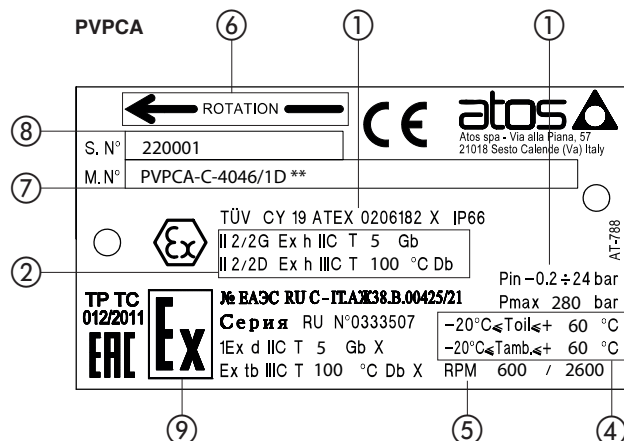
- CX010** AGAM-AO/M, ARAM-AO/M - piloted, with solenoid valve for venting

9 VARIABLE PISTON PUMPS PVPCA and FIXED VANE PUMPS PFEA

Nameplate marking to ATEX and EAC

Gas - group II 2/2G - Zone 1, 2
Dust - group II 2/2D - Zone 21, 22

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ Inlet pressure and max delivery pressure
- ④ Oil and Ambient temperature range
- ⑤ Rotation speed referred to function with mineral oil for other fluid consult Atos technical office
- ⑥ Direction of rotation
- ⑦ Pump model code
- ⑧ Pump serial number
- ⑨ EAC certification marking



ATEX classification - for Gas group II

II 2/2 G	Ex	h	IIC	T5	Gb
Equipment Group II industrial Equipment Category 2/2 (1) Suitable for use G Gas	Mark of Explosion Proof	Protection Method h Protection including c=constructional safety b=control of ignition source k=protection by liquid immersion	Gas Group IIC Hydrogen & Acetylene	Temperature Class T5 ≤ 100°C	Equipment Protection Level Gb High protection (Gas, Zone 1)

ATEX classification - for Dust

II 2/2 D	Ex	h	IIIC	T100	Db
Equipment Group II industrial Equipment Category 2/2 (1) Suitable for use D Dust	Mark of Explosion Proof	Protection Method h Protection including c=constructional safety b=control of ignition source k=protection by liquid immersion	Dust Group IIIC Conductive Dust	Temperature Class T100 ≤ 100°C	Equipment Protection Level Db High protection (Dust, Zone 21)

(1) Equipment of category 2 to be associated with a device (electric motor) of category 2

RELATED DOCUMENTATION

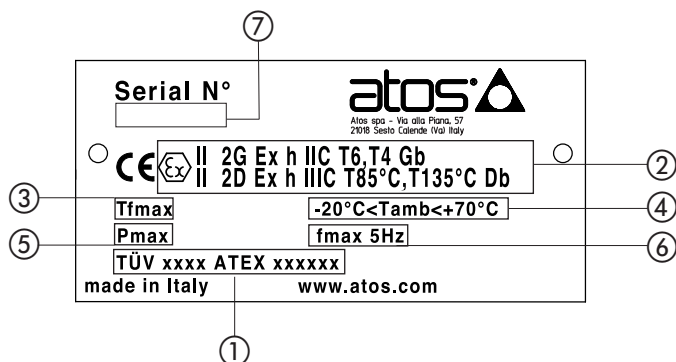
AX010 PVPCA - variable displacement axial piston pumps
 PFEA - fixed displacement vane pumps

10 HYDRAULIC CYLINDERS CKA and SERVOCYLINDERS CKAM

Nameplate marking to ATEX and IECEx

Gas - group II 2G - Zone 1, 2
Dust - group II 2D - Zone 21, 22

- ① ATEX notified body and certificate number
- ② Marking according to ATEX Directive
- ③ Max fluid temperature
- ④ Ambient temperature range
- ⑤ Max working pressure
- ⑥ Max working frequency
- ⑦ Cylinder serial number



ATEX - for Gas group II

II 2 G	Ex	h	IIC	T6 / T4	Gb
Equipment Group II industrial Equipment Category 2 High protection Suitable for use G Gas	Mark of Explosion Proof	Protection Method h Protection including c=constructional safety b=control of ignition source k=protection by liquid immersion	Gas Group IIC Hydrogen & Acetylene	Temperature Class T6 ≤ 85°C T4 ≤ 135°C	Equipment Protection Level Gb High protection (Gas, Zone 1)

ATEX - for Dust

II 2 D	Ex	h	IIIC	T85 / T135	Db
Equipment Group II industrial Equipment Category 2 High protection Suitable for use D Dust	Mark of Explosion Proof	Protection Method h Protection including c=constructional safety b=control of ignition source k=protection by liquid immersion	Dust Group IIIC Conductive Dust	Temperature Class T85 ≤ 85°C T135 ≤ 135°C	Equipment Protection Level Db High protection (Dust, Zone 21)

RELATED DOCUMENTATION

BX500 CKA - cylinders
 CKAM - servocylinders with ex-proof digital position transducer