

# 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 like 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 High performance directionals	on-board	Gas & Dust	X	X			X	see sect. 4
	Directional valves High performance pressure valves	off-board	Gas & Dust	X	X	X	X (only Gas)	X	see sect. 5
	Pressure valves Flow valves		Mining	X	X				see sect. 7
Axis controls	Servoproportional directionals	on-board	Gas & Dust	X	X			X	see sect. 4
On-off valves	Directional valves Pressure relief valves	-	Gas & Dust	X	X	X	X (only Gas)	X	see sect. 6
			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.

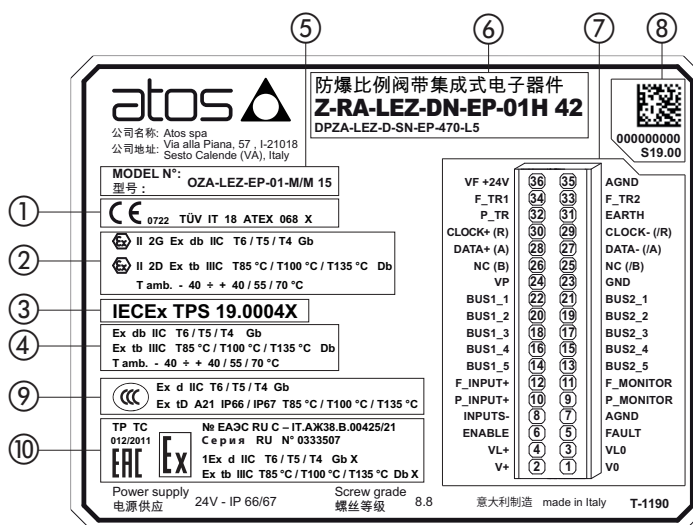
The following sections provide a detailed description of the nameplate marking for component categories.

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**

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

**ATEX / IECEx classification - for Dust**

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

**RELATED DOCUMENTATION**

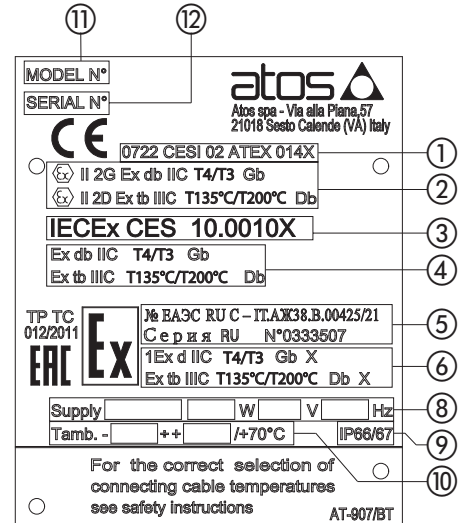
<b>Servoproportional directional - zero overlap with LVDT transducer</b> FX150 DLHZA-TES, DLKZA-TES - direct, sleeve execution FX135 DHZA-TES, DKZA-TES - direct FX235 DPZA-LES, piloted FX380 LIQZA-LES, 3-way cartridge  <b>High performance directional - positive overlap with LVDT transducer</b> FX130 DHZA-TES, DKZA-TES - direct FX230 DPZA-LES - piloted FX360 LIQZA-LES, 2-way cartridge  <b>Directional valves - positive overlap without transducer</b> FX110 DHZA-AES, DKZA-AES - direct FX210 DPZA-AES - piloted  <b>High performance pressure valves - with pressure transducer</b> FX030 RZMA-RES, AGMZA-RES - relief FX060 RZGA-RES, AGRCZA-RES - reducing FX320 LIMZA-RES, LIRZA-RES, LICZA-RES - relief, reducing, compensator	<b>Pressure valves - without transducer</b> 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  <b>Flow valves, pressure compensated</b> FX430 QVHZA-TES, QVKZA-TES - with LVDT transducer FX410 QVHZA-AES, QVKZA-AES - without transducer  <b>Servoproportional valves with on-board axis controller</b> 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**

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

**ATEX / IECEx / EAC classification - for Dust**

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

**RELATED DOCUMENTATION**

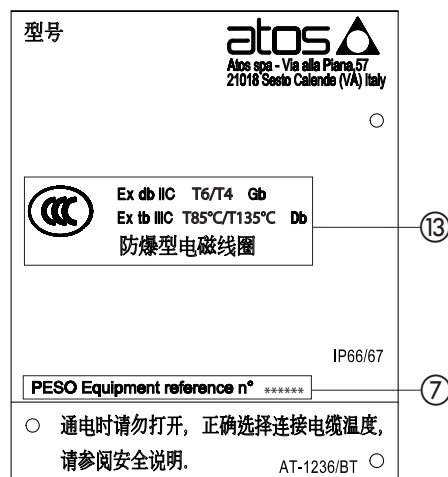
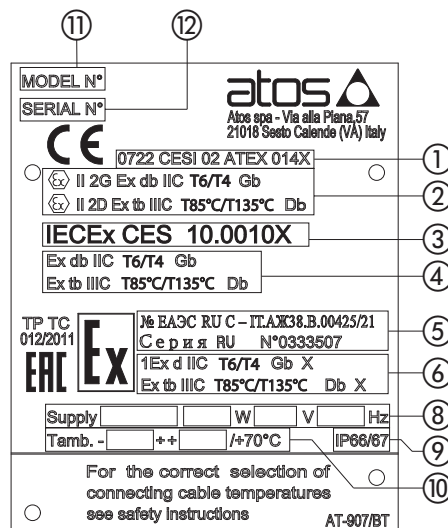
<p><b>Servoproportional directional - zero overlap with LVDT transducer</b></p> <p><b>FX140</b> DLHZA-T, DLKZA-T - direct, sleeve execution  <b>FX370</b> LIQZA-L, 3-way cartridge</p> <p><b>High performance directional - positive overlap with LVDT transducer</b></p> <p><b>FX120</b> DHZA-T, DKZA-T - direct  <b>FX220</b> DPZA-T - piloted  <b>FX350</b> LIQZA-L, 2-way cartridge</p> <p><b>Directional valves - positive overlap without transducer</b></p> <p><b>FX100</b> DHZA-A, DKZA-A - direct  <b>FX200</b> DPZA-A - piloted</p>	<p><b>Pressure valves - without pressure transducer</b></p> <p><b>FX010</b> RZMA-A, HZMA-A, AGMZA-A - relief  <b>FX040</b> RZGA-A, AGRCZA-A, HZGA-A, KZGA-A - reducing  <b>FX070</b> DHRZA-A - reducing  <b>FX300</b> LIMZA-A - relief                  LIRZA-A - reducing                  LICZA-A - compensator</p> <p><b>Flow valves, pressure compensated</b></p> <p><b>FX420</b> QVHZA-T, QVKZA-T - with LVDT transducer  <b>FX400</b> QVHZA-A, QVKZA-A - without transducer</p>
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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
<b>Equipment Group</b> II industrial <b>Equipment Category</b> 2 High Protection <b>Suitable for use</b> G Gas	<b>Mark of Explosion Proof</b>	<b>Protection Method</b> db Flameproof enclosure	<b>Gas Group</b> IIC Hydrogen & Acetylene	<b>Temperature Class</b> T6 ≤ 85°C T4 ≤ 135°C	<b>Equipment Protection Level</b> Gb High protection (Gas, Zone1)

**ATEX / IECEX / EAC classification - for Dust**

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

**RELATED DOCUMENTATION**

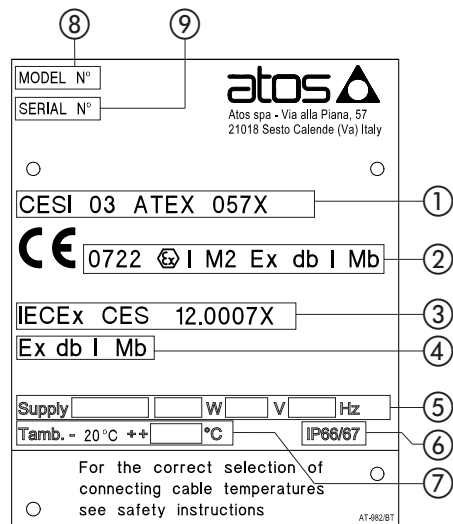
Directional valves	
<b>EX010</b>	DHA - direct, spool type
<b>EX020</b>	DLAH, DLAHM - direct, poppet type CART-LAH, CART-LAHM - cartridge screw-in, direct, poppet type
<b>EX030</b>	DPHA – piloted, spool type
<b>EX050</b>	LIDEW-AO, LIDBH-AO - piloted ISO cartridges and functional covers
Pressure relief valves	
<b>CX010</b>	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**

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

**RELATED DOCUMENTATION**

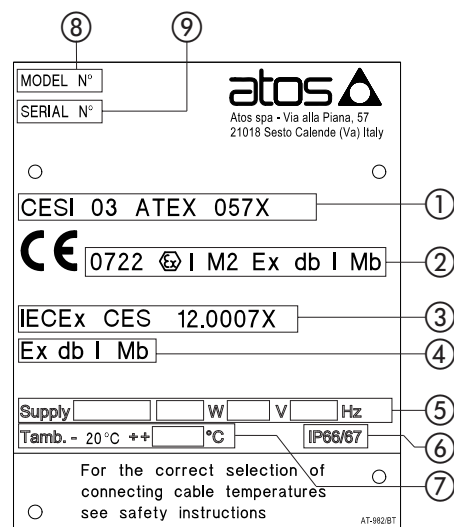
<b>Servoproportional directional - zero overlap with LVDT transducer</b> <b>FX140</b> DLHZA/M-T DLKZA/M-T – direct, sleeve execution	<b>Pressure valves - without pressure transducer</b> <b>FX010</b> RZMA/M-A, HZMA/M-A, AGMZMA/M-A - relief <b>FX040</b> RZGA/M-A, AGRCZA/M-A, HZGA/M-A, KZGA/M-A - reducing <b>FX070</b> DHRZA/M-A - reducing <b>FX300</b> LIMZA/M-A - relief LIRZA/M-A - reducing LICZA/M-A - compensator
<b>High performance directional - positive overlap with LVDT transducer</b> <b>FX120</b> DHZA/M-T, DKZA/M-T – direct	<b>Flow valves, pressure compensated</b> <b>FX420</b> QVHZA/M-T, QVKZA/M-T - with LVDT transducer <b>FX400</b> QVHZA/M-A, QVKZA/M-A - without transducer
<b>Directional valves - positive overlap without transducer</b> <b>FX100</b> DHZA/M-A, DKZA/M-A - direct <b>FX200</b> DPZA/M-A - piloted	

**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**

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

**RELATED DOCUMENTATION**

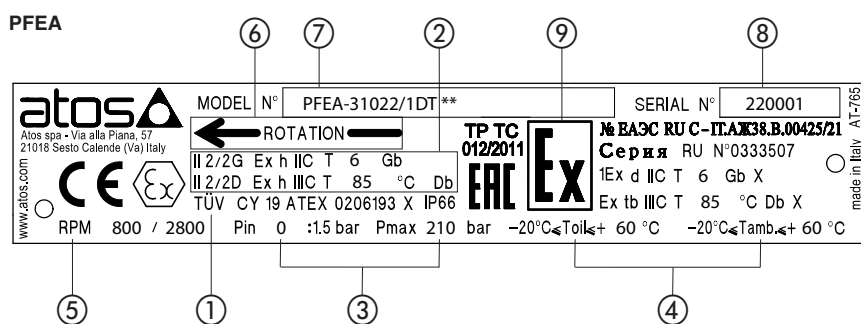
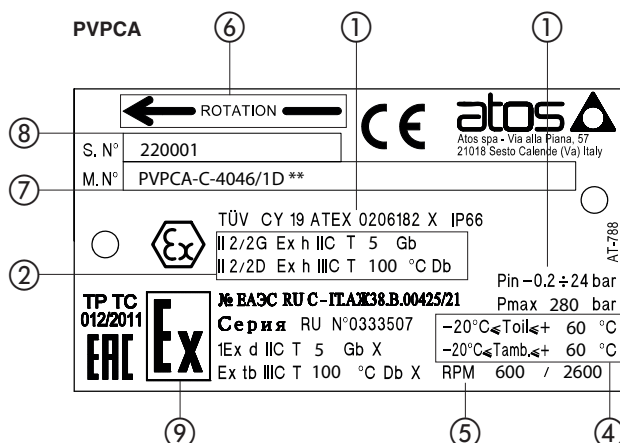
<b>Directional valves</b>	
<b>EX010</b>	DHA/M - direct, spool type
<b>EX020</b>	DLAH/M, DLAHM/M - direct, poppet type CART-LAH/M, CART-LAHM/M - cartridge screw-in, direct, poppet type
<b>EX030</b>	DPHA/M - piloted, spool type
<b>EX050</b>	LIDEW-AO/M, LIDBH-AO/M - piloted ISO cartridges and functional covers
<b>Pressure relief valves</b>	
<b>CX010</b>	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
<b>Equipment Group</b> II industrial <b>Equipment Category</b> 2/2 (1) <b>Suitable for use</b> G Gas	<b>Mark of Explosion Proof</b>	<b>Protection Method</b> h Protection including c=constructional safety b=control of ignition source k=protection by liquid immersion	<b>Gas Group</b> IIC Hydrogen & Acetylene	<b>Temperature Class</b> T5 ≤ 100°C	<b>Equipment Protection Level</b> Gb High protection (Gas, Zone 1)

ATEX classification - for Dust

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

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

RELATED DOCUMENTATION

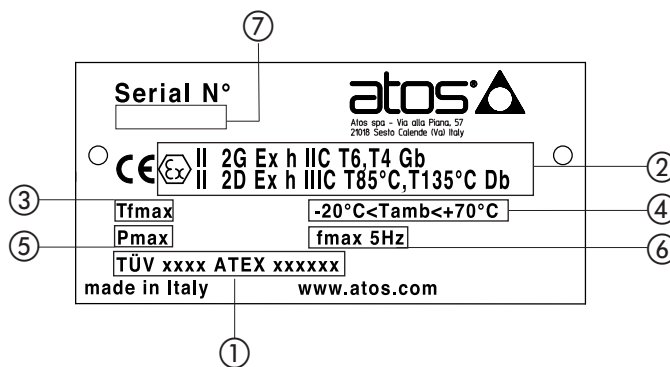
<b>AX010</b> PVPCA - variable displacement axial piston pumps PFEA - fixed displacement vane pumps
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10 HYDRAULIC CYLINDERS CKA and SERVOCYLINDERS CKAM

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

ATEX - for Dust

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

RELATED DOCUMENTATION

<b>BX500</b> CKA - cylinders CKAM - servocylinders with ex-proof digital position transducer
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