Summary of Atos ex-proof components

multicertified to **ATEX, IECEx, EAC, PESO**

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** and **PESO** 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 environements), 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	
Proportional valves	Servoproportional directionals High preformance directionals Directional valves High performance pressure valves Pressure valves Flow valves	on-board	Gas & Dust	X	X			see sect. 4
		off-board	Gas & Dust	X	X	X	X (only Gas)	see sect. 5
			Mining	X	X			see sect. 7
Axis controls	Servoproportional directionals	on-board	Gas & Dust	X	X			see sect. 4
On-off valves	Directional valves Pressure relief valves	-	Gas & Dust	X	X	X	X (only Gas)	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

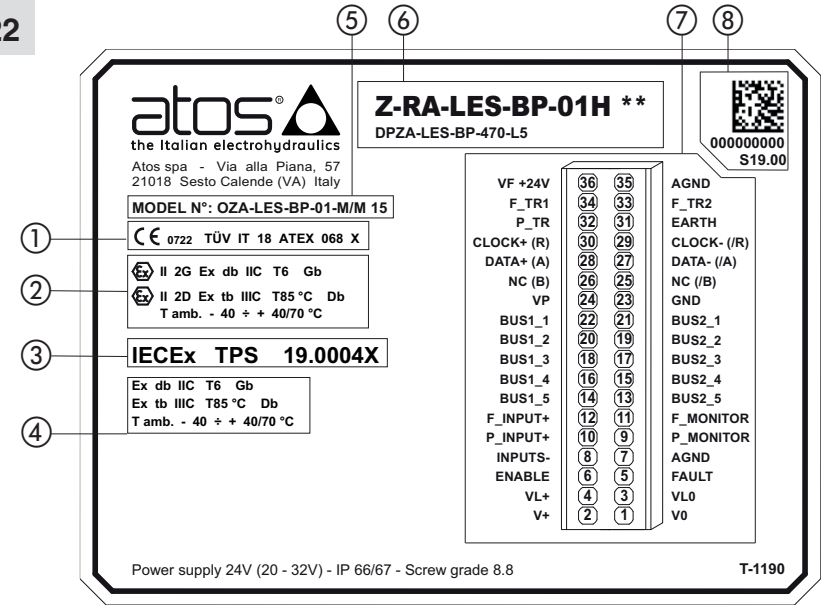
The electrical wiring to the terminal board of ex-proof solenoids, on-board digital drivers and transducers must be performed using ex-proof certified cable glands, see tech. table KX600.
Electric cables must be approved for the specific temperature class reported on the ex-proof component's nameplate, 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.

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

ATEX / IECEX classification - for Gas group II

II 2 G	Ex	d	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** **d** 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 - relieft
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

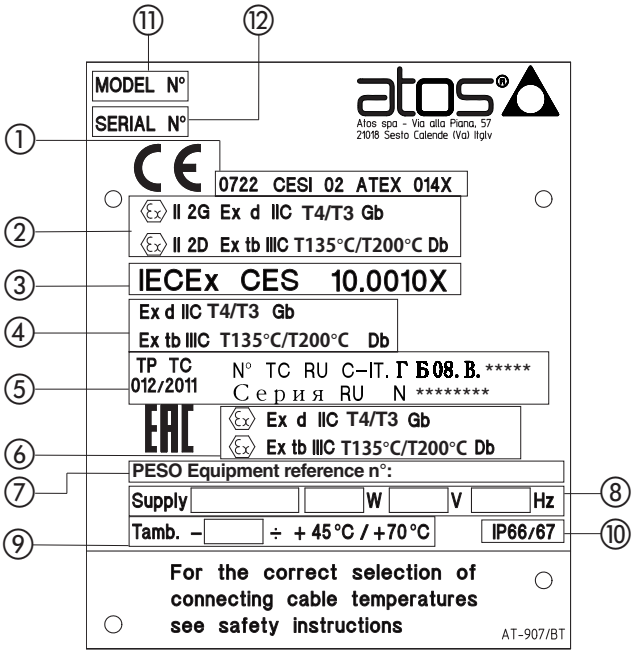
Servoproportional valves with on-board axis controller

FX610 DLHZA-TEZ, DLKZA-TEZ – direct, sleeve execution
FX620 DHZA-TEZ, DKZA-TEZ - direct
FX630 DPZA-LEZ - piloted

Solenoid nameplate marking to ATEX, IECEx, EAC 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 Ambient temperature
⑩ Ingress protection:
-IP66 = no dust ingress, protection against heaving seas or powerful jets of water
-IP67 = no dust ingress, protection to water immersion
⑪ Solenoid model code
⑫ Solenoid serial number



Note: PESO certificate number is not reported on the component nameplate, it is reported in the components technical table.
The certificate can be downloaded from www.atos.com

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

II 2 G	Ex	d	IIC	T4 / T3	Gb
Equipment Group **II** industrial **Equipment Category** **2** High Protection **Suitable for use** **G** Gas	**Mark of Explosion Proof**	**Protection Method** **d** 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

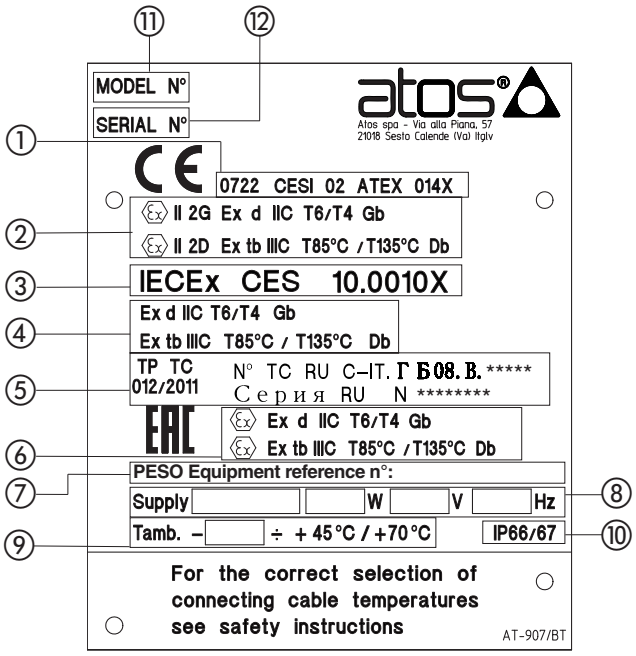
Pressure valves - without pressure transducer
FX010 RZMA-A, HZMA-A, AGMZA-A - relief
FX040 RZGA-A, AGRCZA-A, HZGA-A, KZGA-A - reducing
FX070 DHRZA-A - reducing
FX300 LIMZA-A - relief
LIRZA-A - reducing
LICZA-A - compensator

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

Nameplate marking to ATEX, IECEx, EAC 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 Ambient temperature
⑩ Ingress protection:
-IP66 = no dust ingress, protection against heaving seas or powerful jets of water
-IP67 = no dust ingress, protection to water immersion
⑪ Solenoid model code
⑫ Solenoid serial number



Note: PESO certificate number is not reported on the component nameplate, it is reported in the components technical table.
The certificate can be downloaded from www.atos.com

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

II 2 G	Ex	d	IIC	T6 / T4	Gb
Equipment Group **II** industrial **Equipment Category** **2** High Protection **Suitable for use** **G** Gas	**Mark of Explosion Proof**	**Protection Method** **d** 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

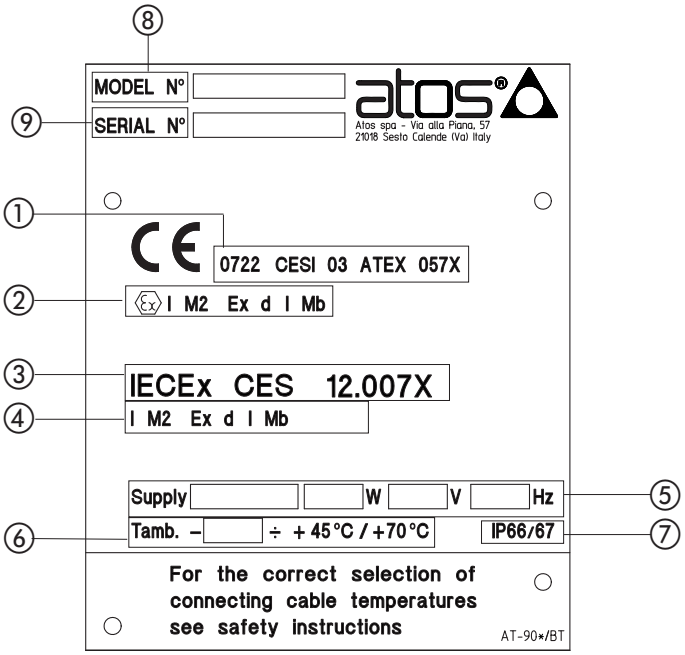
EX010 DHA - direct, spool type
EX020 DLAH, DLAHM - direct, poppet type
CART-LAH, CART-LAHM - cartridge screw-in, direct, poppet type
EX030 DPHA – piloted, spool type
EX050 LIDEW-AO, LIDBH-AO - piloted ISO cartridges and functional covers

Pressure relief valves

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

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 Ambient temperature
⑦ Ingress protection:
-IP66 = no dust ingress, protection against heaving seas or powerful jets of water
-IP67 = no dust ingress, protection to water immersion
⑧ Solenoid model code
⑨ Solenoid serial number

ATEX, IECEx classification - for Gas group I - Mining

I M2	Ex	d	I	Mb
Equipment Group **I** mines **Equipment Category** **M2** High Protection	**Mark of Explosion Proof**	**Protection Method** **d** 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

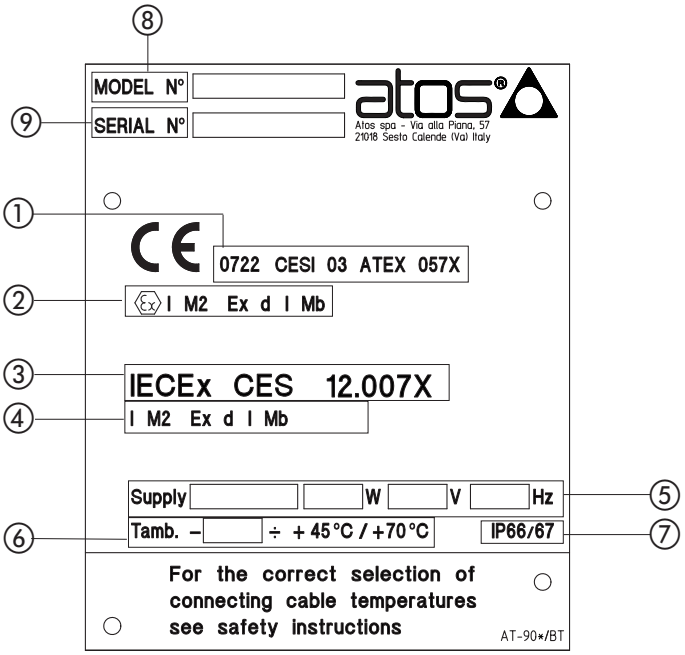
Pressure valves - without pressure transducer
FX010 RZMA/M-A, HZMA/M-A, AGMZA/M-A - relief
FX040 RZGA/M-A, AGRCZA/M-A, HZGA/M-A, KZGA/M-A - reducing
FX070 DHRZA/M-A - reducing
FX300 LIMZA/M-A - relief
LIRZA/M-A - reducing
LICZA/M-A - compensator

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

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 Ambient temperature
⑦ Ingress protection:
-IP66 = no dust ingress, protection against heaving seas or powerful jets of water
-IP67 = no dust ingress, protection to water immersion
⑧ Solenoid model code
⑨ Solenoid serial number



ATEX, IECEx classification - for Gas group I - Mining

I M2	Ex	d	I	Mb
Equipment Group **I** mines **Equipment Category** **M2** High Protection	**Mark of Explosion Proof**	**Protection Method** **d** 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

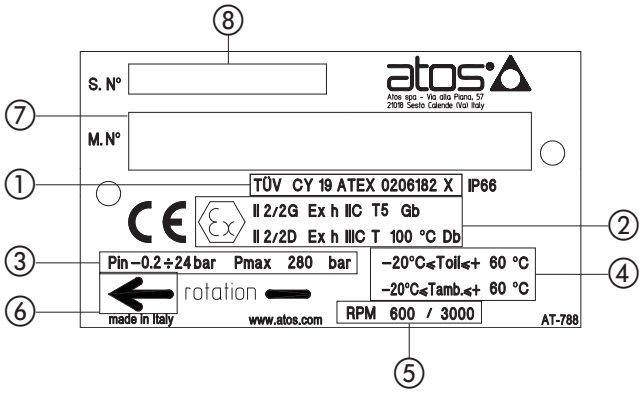
CX010 AGAM-AO/M, ARAM-AO/M - piloted, with solenoid valve for venting

Nameplate marking to ATEX and IECEx

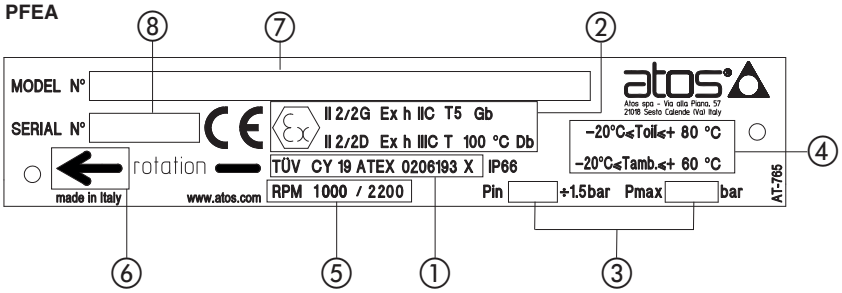
Gas - group II 2/2G - Zone 1, 2
Dust - group II 2/2D - Zone 21, 22

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

PVPCA



PFEA



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

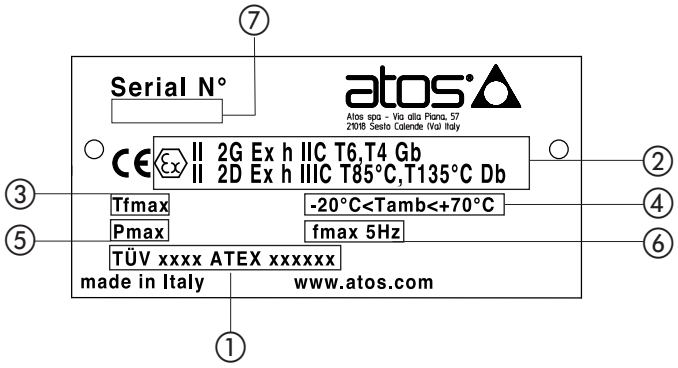
RELATED DOCUMENTATION

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

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