

EXPLOSION-PROOF CLASSIFICATION HL-KD2 Solenoid and Proportional Valves

Explosion-Proof Classification

For HL-HD2 Solenoid and Proportional Valves

Reference Catalogs:

PRESSURE CONTROL VALVES						
PR*SPUHL RQM*K*-P 21 515						
	P*E*K*	81 316				
ZDE3K* 81 515						
VER*HL DZCE*K* 81 606						

FLOW CONTROL VALVES					
	QDE3K	82 225			

DIRECTIONAL VALVES					
VSD*HL D*K* 42 225					
	DT3K*	42 215			
VED*HL DS(P)E*K* 83 510					

General Information:

This informative technical datasheet displays information about classification and marking of Duplomatic explosion-proof valves range.

Duplomatic MS offers valves with the following certifications:

ATEX	ll 2G	II 2D	I M2
IECEx	Gb	Db	Mb
INMETRO	Gb	Db	Mb
PESO	Gb		

Instructions for use and maintenance can be found in the related manuals, always supplied toghether with valves.

<u>CONTINENTAL</u>



EXPLOSION-PROOF CLASSIFICATION

HL-KD2 Solenoid and Proportional Valves

1 - ATEX CLASSIFICATION AND TEMPERATURES

Duplomatic certificates the combination valve-coil for the valves suitable for application and installation in potentially explosive atmospheres, according to ATEX directive; the supply always includes the declaration of conformity to the directive and the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environments.

Coils assembled on these valves have been separately certified according to ATEX directive and so they are suitable for use in potentially explosive atmospheres.

1.1 - ATEX classification for valves

Type examination certificate: AR18ATEX055

The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

ATEX II 2G ATEX II 2D	*KD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally. The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.
ATEX I M2	*KDM2	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

1.2 - ATEX marking for valves

valve code		N and V seals	NL seals
*KD2	for gas	⟨Ēx⟩ II 2G IIC T4 Gb (-20°C Ta +80°C)	⟨Ex⟩ 2G C T4 Gb (-40°C Ta +80°C)
	for dusts	⟨Ex⟩ II 2D IIIC T154°C Db IP66/IP68 (-20°C Ta +80°C)	(Ex) II 2D IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)
*KD2 /T5	for gas	(EX) II 2G IIC T5 Gb (-20°C Ta +55°C)	𝔄 II 2G IIC T5 Gb (-40°C Ta +55°C)
"KD2 /15	for dusts	⟨Ex⟩ II 2D IIIC T129°C Db IP66/IP68 (-20°C Ta +55°C)	(Ex) II 2D IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)
*KDM2	mining	⟨Ēx⟩ M2 T150°C Mb IP66/68 (-20°C Ta +75°C)	⟨Ex⟩ M2 T150°C Mb IP66/68 (-40°C Ta +75°C)

Specific marking as ATEX 2014/34/EU directive and related technical specifications °C °C Т b **IP66/IP68** Ta+ Ambient temperature range Group: **I** = mining equipment Protection degree from atmospheric agents II = for surface plants according to IEC EN 60529 (this field is not intended for category 2G) Category of protection: M2 = (mining) high protection EPL - protection level for electrical devices This equipment is intended to be de-energised in the event of an explosive atmosphere Mb = for mines - having a "high" level of protection, which has 2G = (surface, atmosphere with gas) sufficient security that it is unlikely to become a source of ignition in normal operation or during expected malfunctions in the time span high protection eligible for category 2 (zone 1) between there being an outbreak of gas and the equipment being automatically liable for category 3 (zone 2) de-energized. 2D = (surface, atmosphere with dusts) Gb = for explosive gas atmospheres - having a "high" level of high protection protection, which is not a source of ignition in normal operation or eligible for category 2 (zone 21) during expected malfunctions. automatically liable for category 3 (zone 22) Db = equipment for explosive dust atmospheres - having a "high" level of protection, which is not a source of ignition in normal operation or during expected malfunctions Temperature class / max surface temperature see par. 1.5 Group of gas / dusts for which the equipment is certified I = for mining: firedamp and/or combustible dusts IIC = for gas - eligible also for group IIA and IIB

IIIC = for dusts - eligible also for group IIIA and IIIB



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1.3 - ATEX classification of the coils

The coil of the explosion-proof valves is ATEX certified itself and, as such, is identified with its own tag, carries the relative ATEX marking. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

1.4 - ATEX marking on coils

for valve type	for gas	€x II 2G Ex db IIC T4 Gb (-40°C Ta +80°C)	
*KD2	for dusts	$\langle \overline{\xi x} \rangle$ II 2D Ex tb IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)	
for valve type *KD2 /T5	for gas	(Ex) II 2G Ex db IIC T5 Gb (-40°C Ta +55°C)	
	for dusts	$\langle \overline{\xi x} \rangle$ II 2D Ex tb IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)	
for valve type * KDM2	mining	(Ex) I M2 Ex db I T150°C Mb IP66/IP68 (-40°C Ta +75°C)	

Specific marking as ATEX 2014/34/EU directive and related technical specifications °C) Έχ Т °C b **IP66/IP68** Ta+ Ex Ambient temperature range Group: Protection degree from atmospheric agents according to IEC EN 60529 (this field is not I = mining equipment II = equipment for surface plants intended for category 2G) EPL - protection level for electrical devices Mb = for mines - having a "high" level of protection, which has Category of protection: sufficient security that it is unlikely to become a source of ignition in M2 = (mining) high protection normal operation or during expected malfunctions in the time span This equipment is intended to be de-energised between there being an outbreak of gas and the equipment being in the event of an explosive atmosphere de-energized. 2G = (surface, atmosphere with gas) Gb = for explosive gas atmospheres - having a "high" level of high protection protection, which is not a source of ignition in normal operation or eligible for category 2 (zone 1) during expected malfunctions. automatically liable for category 3 (zone 2) Db = equipment for explosive dust atmospheres - having a "high" 2D = (surface, atmosphere with dusts) level of protection, which is not a source of ignition in normal high protection operation or during expected malfunctions eligible for category 2 (zone 21) automatically liable for category 3 (zone 22) Temperature class / max surface temperature see par. 1.5 Group of gas / dusts for which the equipment is certified I = for mining: firedamp and/or combustible dusts IIC = for gas - eligible also for group IIA and IIB IIIC = for dusts - eligible also for group IIIA and IIIB Coil protection type:

db = flameproof enclosure **tb** = protection from dust by enclosure

1.5 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

The valves in group	Il can also be used f	for less limiting ten	nperature classes (surface tem	perature allowed high	er).
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		temperature range	N and V seals	NL seals	Temperature class	eligible also for
ATEX II 2G ATEX II 2D	*КD2	of ambient	20 / +80 °C	-40 / +80 °C	T4 (gas)	T3, T2, T1
	KD2	of fluid			T154°C (dusts)	T200°C and higher
	*KD2 /T5	of ambient -	20 / +55 °C	-40 / +55 °C	T5 (gas)	T4, T3, T2, T1
		of fluid	-20 / +60 °C	-40 / +60 °C	T129°C (dusts)	T135°C and higher
ATEX I M2	*KDM2	of ambient	20 / ±75 °C	40 / ±75 °C	T150°C	
		of fluid	-207+75°C	-407 473 C	1150 C	-

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2 - IECEX CLASSIFICATION AND TEMPERATURE S

The IECEx certification requires the classification of the electrical equipment only.

Duplomatic supplies valves with IECEx certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

2.1 - IECEx classification

Certificate of conformity (CoC): IECEx TUN 15.0028X

The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

IECEx Gb IECEx Db	*KXD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally. The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.
IECEx Mb	*KXDM2	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

2.2 - IECEx marking

There is a plate with the IECEx mark on each coil.

* KXD2 valves	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)
	for dusts	Ex tb IIIC T135°C Db (-40°C Ta +80°C)
*KXD2 /T5 valves	for gas	Ex db IIC T5 Gb (-40°C Ta +55°C)
	for dusts	Ex tb IIIC T100°C Db (-40°C Ta +55°C)
* KDM2 valves	mining	Ex db I Mb (-40°C Ta +80°C)

Conformity marking to the IECEx certification scheme °C °C Ex Т Ta+ Ambient temperature range Protection type: EPL - protection level for electrical devices db = flameproof enclosure Mb = for mines - having a "high" level of protection, which has sufficient tb = protection from dust by enclosure security that it is unlikely to become a source of ignition in normal operation or during expected malfunctions in the time span between there Group of gas / dusts for which the equipment is certified being an outbreak of gas and the equipment being de-energized. I = for mining: firedamp and/or combustible dusts Gb = for explosive gas atmospheres - having a "high" level of protection, IIC = for gas - eligible also for group IIA and IIB which is not a source of ignition in normal operation or during expected IIIC = for dusts - eligible also for group IIIA and IIIB malfunctions Db = equipment for explosive dust atmospheres - having a "high" level of Temperature class/max surface temperature see par. 2.3 protection, which is not a source of ignition in normal operation or during

2.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

expected malfunctions

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
	* • • • • • • • • • • • • • • • • • • •	of ambient	20 / ±80 °C	40 / ±90 °C	T4 (gas)	T3, T2, T1
IECEx Gb	RAD2	of fluid	fluid	-407+80 C	T135°C (dusts)	T200°C and higher
IECEx Db	*KYD2 /T5	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas)	T4, T3, T2, T1
	KAD2 /15	of fluid	-20 / +60 °C	-40 / +60 °C	T100°C (dusts)	T135°C and higher
IECEx Mb	*KXDM2	of ambient	20 / ±80 °C	10 / ±80 °C		
		of fluid	-207+80 C	-40/ FOU C	-	-

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

2.4 - Protection degree from atmospheric agents (IEC EN 60529)

Protection degree from atmospheric agents according to IEC EN 60529 is IP66/IP68.

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3 - INMETRO CLASSIFICATION AND TEMPERATURE

The INMETRO certification requires the classification of the electrical equipment only.

Duplomatic supplies valves with INMETRO certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

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Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

3.1 - INMETRO classification

Certificate of conformity: TÜV 19.1844 X

The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

INMETRO Gb INMETRO Db	*KBD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally. The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.
INMETRO Mb	*KBDM2	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

3.2 - INMETRO marking

There is a plate with the INMETRO mark on each coil.

*KBD2	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)			
valves	for dusts	Ex tb IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)			
*KBD2 /T5 valves	for gas	for gas Ex db IIC T5 Gb (-40°C Ta +55°C)			
	for dusts	Ex tb IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)			
* KBDM2 valves	mining	Ex db I T150° Mb IP66/IP68 (-40°C Ta +75°C)			



3.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
	***	of ambient	20 / ±90 °C	40 / ±90 °C	T4 (gas)	T3, T2, T1
INMETRO Gb	"KDD2	of fluid	-20/+80 C	-407+80 C	T154°C (dusts)	T200°C and higher
INMETRO Db	*KBD2 /T5	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas)	T4, T3, T2, T1
	KBDZ /15	of fluid	-20 / +60 °C	-40 / +60 °C	T129°C (dusts)	T135°C and higher
	*KBDM2	of ambient	-20 / +75 °C	-40/+75 °C	T150°C	_
	RODWIZ	of fluid	-207 110 0	-407 173 0	1100 0	-

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

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4 - PESO CLASSIFICATION AND TEMPERATURES

The PESO certification requires the classification of the electrical equipment only.

Duplomatic supplies valves with PESO certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

4.1 - PESO classification

Certificate of conformity: P480801

The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

PESO Gb	*KPD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists are likely to occur occasionally. The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.
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4.2 - PESO marking

There is a plate with the PESO mark on each coil.

*KPD2 valves	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)
*KPD2 /T5 valves	for gas	Ex db IIC T5 Gb (-40°C Ta +55°C)

Conformity marking to the PESO certification scheme °C db Ex IIC Т Gb Ta + С Ambient temperature range Protection type EPL - protection level for electrical devices for explosive gas by flameproof enclosure atmospheres - having a "high" level of protection, which is not a source of ignition in normal operation or during expected malfunctions. The equipment is certified for group of gas IIC eligible also for group IIA and IIB

Temperature class/max surface temperature see par. 4.3 -

4.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
	******	of ambient	20 / ±80 °C	40 / ±80 °C	T4 (gas)	T2 T2 T1
DESO Ch	NF D2	of fluid	-207+00 C -407+00 C 14 (gas)	13, 12, 11		
FLOO GD	**	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (goo)	T4 T2 T2 T1
	KPD2 /15	of fluid	-20 / +60 °C	-40 / +60 °C	TO (gas)	14, 13, 12, 11

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

4.4 - Protection degree from atmospheric agents (IEC EN 60529)

Protection degree from atmospheric agents according to IEC EN 60529 is IP66/IP68.





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VEA-3D-A (5 PIN) 160415 (9 ft. cord)	VEA-3L-A (M12 4 PIN) 264054 (9 ft. cord)			Strain Relief
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Connectors and Cables Sets Form #1027453



a member of **DAIKIN** group

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HL-KD2 Solenoid and Proportional Valves



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