



Ingress Protection Codes to IEC / EN 60529

First numeral (solids)	Second numeral (liquids)
0	No protection
1	Vertically dripping water – e.g. condensation
2	-75 to 90° angled drops
3	Direct sprayed water
4	Water splashes – all directions – limited ingress OK
5	LP water jets – limited ingress OK
6	Heavy seas, HP jets – limited ingress OK
7	Some immersion (0.15 - 1 metre depth)
8	Indefinite immersion (long periods under pressure)

Minimum IP Ratings for gases and vapours

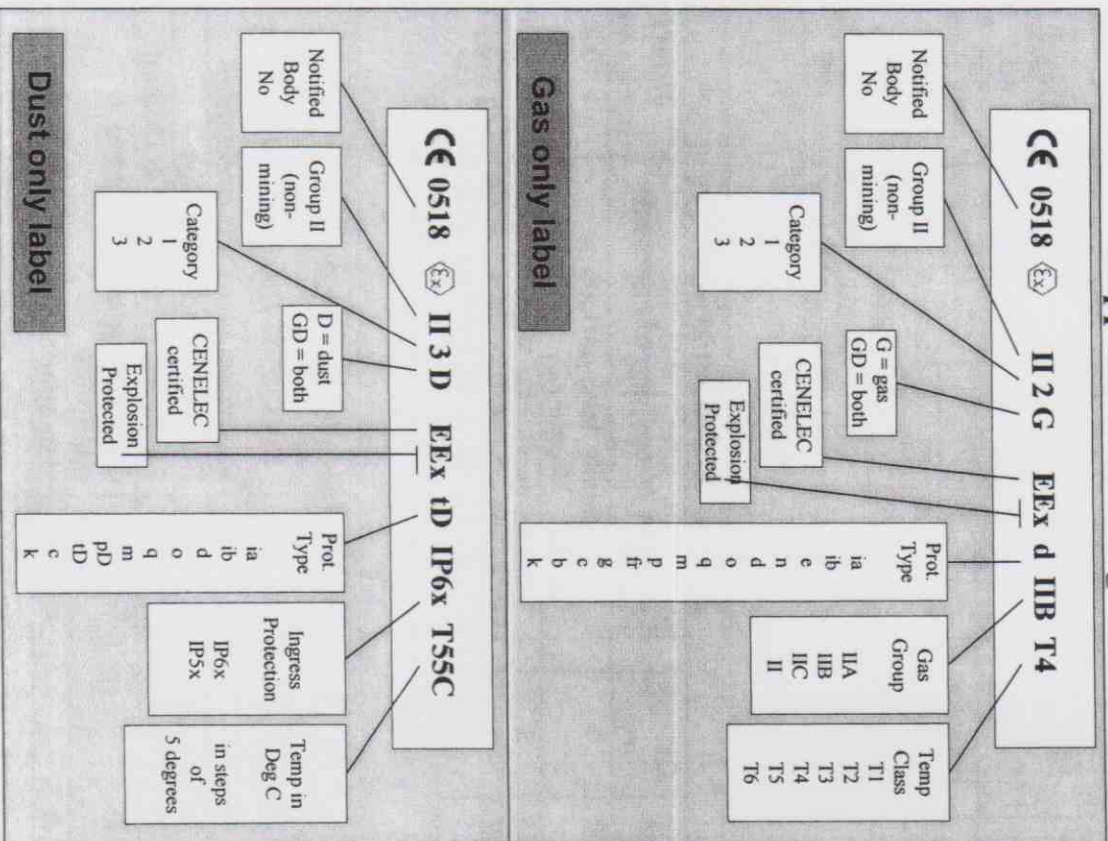
	Electrical	Non-electrical
Normal minimum	IP 54	IP ??
Apparatus subject to hosing down	IP 55	IP ??
Offshore areas	IP 65	IP ??

NOTE:
For non-electrical apparatus the IP Rating is dependant upon the Protection Method, equipment function and duty.

Minimum IP Ratings for dusts

Dust type	Zone 20	Zone 21	Zone 22
Conducting	IP 6X	IP 6X	IP 6X
Non-conducting	IP 6X	IP 6X	IP 5X

Apparatus Marking





Gas Grouping		
Group	Typical gas	Min. ignition energy μ Joules
IIA	Propane	180
IIB	Ethylene	60
IIC	Hydrogen	20

Temperature Class		
T Class	Deg C	
T1	450	
T2	300	
T3	200	
T4	135	
T5	100	
T6	85	

Zones & Categories			
Zone	Category	Explosive atmosphere is present:	Hours per annum
0 / 20	1	Continually, long periods or frequently	> 1000
1 / 21	2	Intermittently, likely	10 - 1000
2 / 22	3	Abnormally or unlikely and for short periods	<10 (max 1h)

Protection Concepts – Listed by Zone				
Ex	Method	Zone 2	Zone 1	Zone 0
Ex ia	Intrinsic safety – safe with 2 faults	GD	GD	GD
Ex k	Liquid immersion	GD	GD	GD
Ex c	Constructional Safety	GD	GD	(GD)
Ex ib	Intrinsic safety – safe with 1 fault	GD	GD	
Ex d	Flameproof	GD	GD	
Ex o	Oil immersion	GD	GD	
Ex q	Quartz powder filled	GD	GD	
Ex m	Encapsulation	GD	GD	
Ex e	Increased safety	G	G	
Ex p	Pressurisation	G	G	
Ex pD	Pressurisation (Dusts)	D	D	
Ex n	Non-igniting	G		
Ex fr	Flow restricting enclosure	G		
Ex tD	Enclosure temperature	D	D	D
Ex g	Inherent Safety			
Ex b	Control of ignition sources			

Sub Divisions of Type n			
IEC	CENELEC	Protection Concept within Type n	
R	R	Restricted breathing enclosures	
L	L	Energy limited apparatus	
Z	P	Simplified pressurised enclosure	
C	C	Otherwise protected sparking apparatus	
A	A	Non-sparking apparatus	

Apparatus Certificate suffixes	
X	Special conditions apply to this certificate
B	Old method of indicating special conditions
U	This is only a component – other protection required
S	I.S. apparatus that must be installed in a non-hazardous area (was Safe Area)
s	Used with Ex s certificates
/2	Revision 2 of the Certificate