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INSTRUCTIONS FOR USE

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LINKS

A link is signalled when the mouse pointer changes from a hand to a pointing finger. For example where a page number is referenced.



FIT TO SCREEN

The default for each page is fit to screen, which allows a full view of the page without the need to scroll.


TO ENLARGE THE PAGE

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Use the  and  buttons, usually found on the toolbar at the top of the screen, to move backwards and forwards through the pages. There is a page counter at the bottom left of the screen that indicates where you are in the sequence. You can also move to other pages by highlighting the page numbers and typing in a number.

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**CLICK HERE
TO CONTINUE**



EExe and EExd Enclosures for Worldwide Applications

Featuring the New ATEX range



HAWKE
International



Introduction

A QUALITY COMPANY ALWAYS DEMANDS THE BEST

For those who demand quality, reliability and above all, safety, Hawke products are the obvious choice.

Smarter Products

Hawke International is a member of the worldwide Hubbell Group of Companies and is a well established leading manufacturer of electrical equipment for Hazardous (Classified) locations and hostile environments, with an innovative range of cable connection, termination and barrier products.

Worldwide

Located in Manchester, UK, Hawke International has subsidiary companies in Houston, USA and Singapore, along with direct representation in Brazil, the Middle East and Canada. Hawke International is supported worldwide by the Hubbell Group as well as by a network of agents and distributors.

Product Development

A commitment to the development of innovative features which improve the safety, versatility, reliability and ease of use of our products.

First Choice

Used on Offshore and Onshore oil and gas exploration and production facilities. Hawke's products are the 'First Choice' for the world's major oil and gas companies.

A Quality Company

Hawke International's products are designed and manufactured under a quality system not only complying with ISO 9001 but also with the latest international standards. Rigorous and regular in-house testing ensures that every product manufactured meets the highest quality standards.



Introduction

Hawke International

"Leading the way in the design of Smarter Products"

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Increased Safety EExe

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PL6 series



PL6 Series





Glass Reinforced Polyester PL6 Series Enclosures

Increased Safety EExe



PL6 Series Enclosures

Features

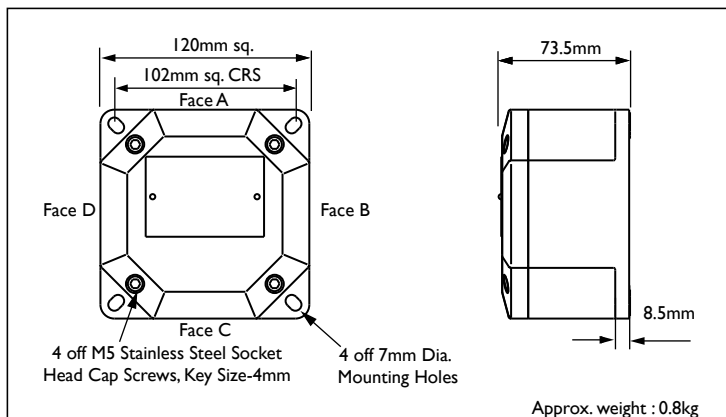
- The Ultimate in Robust GRP Construction**
 Designed to withstand impact resistance up to 20Nm.
 GRP Construction provides a high degree of resistance to corrosive atmospheres.
- Anti-Static Properties**
 Removes the risk of ignition sources through static induced sparking resistivity.
 Insulation Resistance in accordance with EN 50014 : 1998, which does not exceed 1 GΩ.
- External Mounting Feet**
 Eliminates the need to remove the lid when mounting the enclosure on the wall.
- Corrosion Resistant Stainless Steel Lid Fixing Screws with Nylon Retaining Washers**
 Prevents loss of screws during assembly and maintenance.
- One Piece Durable Captive Moulded Silicone Gasket**
 DTS01 deluge protection witnessed by EECs.
 Provides Ingress Protection to IP66 and IP67.
 Optimum performance at low and high temperature extremes.
- Stainless Steel Rating Label**
 Highly durable and corrosion resistant.



Enclosure Type

Glass Reinforced Polyester PL612

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE			
Thread Size	M16/M20	M25	M32
Quantity	2 *	1	1#

* Shroud not possible with earth continuity plate option.

Not possible with an earth continuity plate.

Note: For Cable Entry Positions see page 11.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- PL612 BASEEFA Certificate No. BAS 01 ATEX 2107X.
- ZPL612 BASEEFA Certificate No. BAS 01 ATEX 2101U.
- Suitable for use in Zone I, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 and IP67 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -60°C to +75°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 273. For PL612.
- Assembly instruction data sheet No. A.I. 272. For ZPL612.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 13.

TERMINAL CAPACITY DATA							
Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5N	0.5	2.5	420	12	16	7	21
WDU 2.5	0.5	2.5	550	10	18	8	21
WDU 4	0.5	4	750	10	23	7	28
WDU 6	0.5	6	550	7	34	6	36
WDU 10	1.5	10	550	6	47	5	50
BK6	1	4	275	1	21	N/A	N/A
MK6/6	1	6	420	1	26	N/A	N/A
HTB6	0.5	Max. Per Pillar: 2 x 10mm ² 3 x 6mm ² 4 x 4mm ² 4 x 0.5mm ² MIN	550	1	Conductor Size mm ²	Max Amps Per Pillar	N/A
					0.5	1	
					0.75	1	
					1	8	
					1.5	10	
					2.5	15	
					4	21	
					6	26	
					10	37	

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

An earth terminal equal to that of the largest power terminal will be fitted.

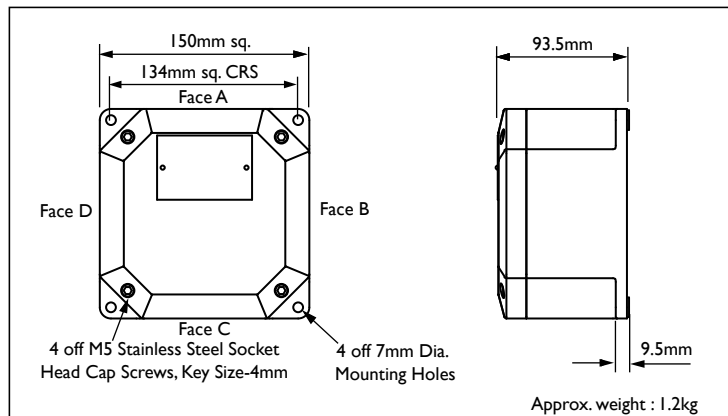




Enclosure Type

Glass Reinforced Polyester PL615

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE			
Thread Size	M16/M20	M25	M32
Quantity	2	2	1

Note: For Cable Entry Positions see page 11.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- PL615 BASEEFA Certificate No. BAS 01 ATEX 2107X.
- ZPL615 BASEEFA Certificate No. BAS 01 ATEX 2101U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 and IP67 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -60°C to +75°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 273. For PL615.
- Assembly instruction data sheet No. A.I. 272. For ZPL615.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 13.

TERMINAL CAPACITY DATA							
Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	14	17	9	21
WDU 4	0.5	4	750	12	23	8	28
WDU 6	0.5	6	550	9	33	7	36
WDU 10	1.5	10	550	7	48	6	50
WDU 16	1.5	16	550	6	65	5	66
HTB6	0.5	Max. Per Pillar: 2 x 10mm ² 3 x 6mm ² 4 x 4mm ² 4 x 0.5mm ² MIN	550	1	Conductor Size mm ²	Max Amps Per Pillar	N/A
					0.5	1	
					0.75	1	
					1	8	
					1.5	10	
					2.5	15	
					4	21	
					6	26	
					10	37	

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

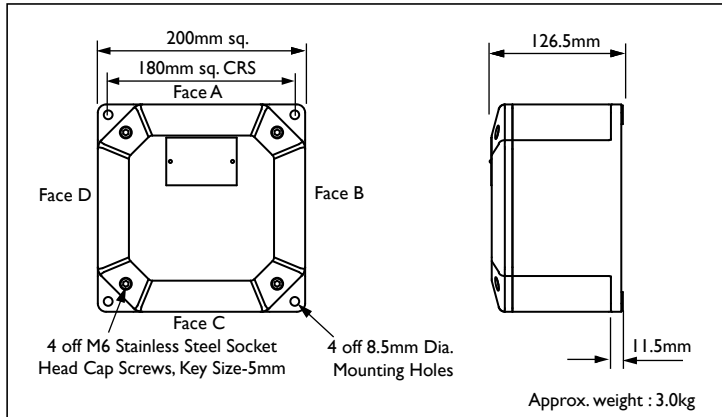
☐ An earth terminal equal to that of the largest power terminal will be fitted.



Enclosure Type

Glass Reinforced Polyester PL620

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE					
Thread Size	M16/M20	M25	M32	M40	M50
Quantity	6	4	2	1#	1#

Not possible with an earth continuity plate.

Note: For Cable Entry Positions see page 12.

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- PL620 BASEEFA Certificate No. BAS 01 ATEX 2107X.
- ZPL620 BASEEFA Certificate No. BAS 01 ATEX 2101U.
- Suitable for use in Zone I, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 and IP67 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -60°C to +75°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 273. For PL620.
- Assembly instruction data sheet No. A.I. 272. For ZPL620.
- Alternative Certification Options Available.

Exe II.

AExe II/Exe II.

For full Technical Specification see page 13.

PL6 Series GRP Enclosures

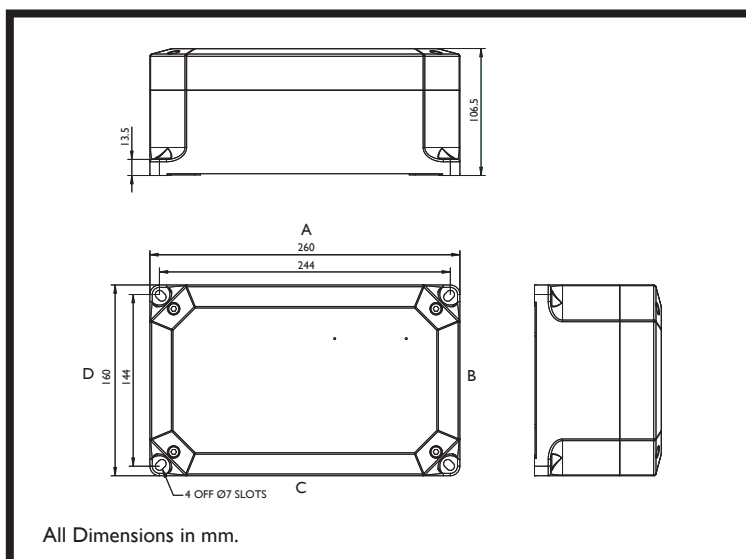
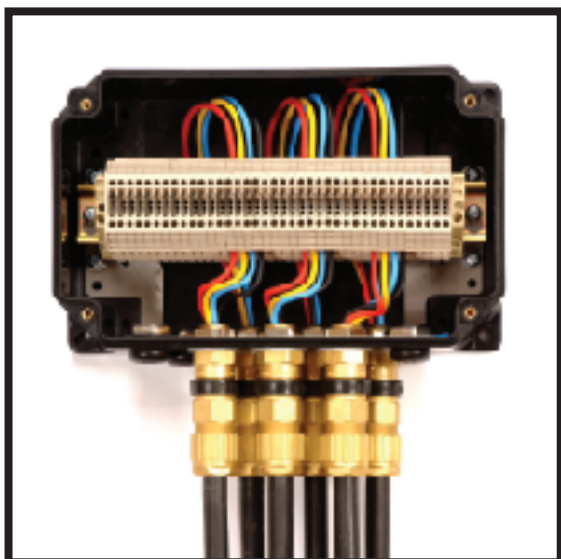
TERMINAL CAPACITY DATA							
Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	24	15	13	21
WDU 4	0.5	4	750	20	21	11	28
WDU 6	0.5	6	550	15	30	10	36
WDU 10	1.5	10	550	12	42	8	50
WDU 16	1.5	16	550	9	62	8	66
WDU 35	2.5	35	750	6	109	6	109
WDU 70N	10	70	750	4	157	3	167

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ An earth terminal equal to that of the largest power terminal will be fitted.

PL626

PL626 Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES

Thread Size	M16	M20/O	M20/A	M25	M32
Face A / C	9	9	7	4	3
Face B / D	3	3	3	2	1

Technical Data

- Increased Safety EExe. II 2 GD EExe II. PL626 Baseefa Certificate No. BAS 01 ATEX 2107X.
- ZPL626 (Empty) Baseefa Certificate No. BAS 01 ATEX 2107U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 and IP67 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -60°C to +75°C. Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm²)		Max. Volts	Max. No. of Terminals		High Power Applications	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	38	11	22	15
WDU 4	0.5	4	750	32	15	18	21
WDU 6	0.5	6	550	24	22	16	27
WDU 10	1.5	10	550	19	32	14	37
WDU 16 *	1.5	16	550	16	43	12	49
WDU 35 *	2.5	35	750	12	72	10	81

* Rail mounted directly on the base of the box.

Notes:

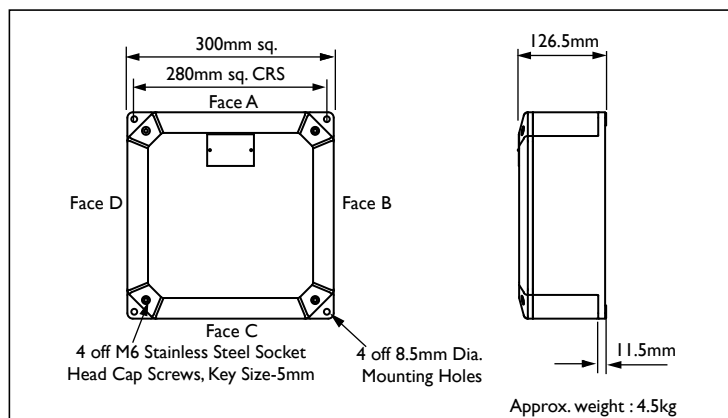
- A combination of different sized entries is possible, please contact Hawke for more information.
- The table above gives an indication of potential terminal arrangements. Please contact Hawke for information on other arrangements or empty enclosures.
- A combination of different sized terminals is possible, please contact Hawke for more information.
- Other terminal types are available.



Enclosure Type

Glass Reinforced Polyester PL630

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE							
Thread Size	M16/M20	M25	M32	M40	M50	M63	M75
Quantity	10	8	3	3	2	2#	1#

Not possible with an earth continuity plate.

Note: For Cable Entry Positions see page 12.

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- PL630 BASEEFA Certificate No. BAS 01 ATEX 2107X.
- ZPL630 BASEEFA Certificate No. BAS 01 ATEX 210IU.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 and IP67 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -60°C to +75°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 273. For PL630.
- Assembly instruction data sheet No. A.I. 272. For ZPL630.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 13.

PL6 Series GRP Enclosures

TERMINAL CAPACITY DATA							
Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	76	9	16	21
WDU 4	0.5	4	750	64	13	14	28
WDU 6	0.5	6	550	48	18	13	36
WDU 10	1.5	10	550	36	27	11	50
WDU 16	1.5	16	550	30	38	10	66
WDU 35	2.5	35	750	22	65	7	109
WDU 70N	10	70	750	11	113	5	167

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ An earth terminal equal to that of the largest power terminal will be fitted.



Cable Gland Entry Positions PL6 Series GRP Enclosures

Increased Safety EExe

PL6 Series Gland Entry Positions

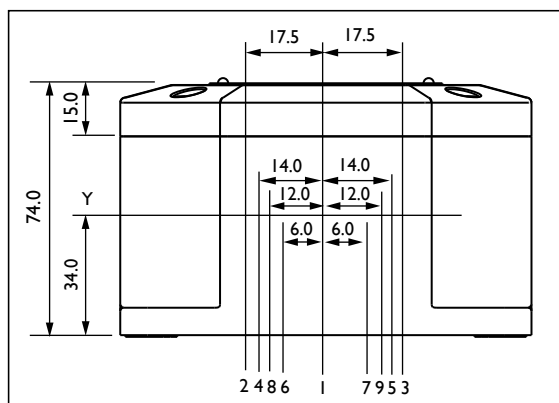
PL612 CABLE GLAND ENTRY POSITIONS			
Entries Per Face	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)		
	M16/M20	M25	M32
1	1Y or 8Y # or 9Y #	1Y or 6Y # or 7Y #	1Y *
2 \$	2Y & 3Y (No Continuity Plate) 4Y & 5Y (With Continuity Plate) Max. Gland Size 24 A/F Shroud not Possible	-	-

* Continuity Plate not permitted.

This entry position is offset from the terminal rail.

\$ Double entries may not be possible with full terminal rail capacity see page 41.

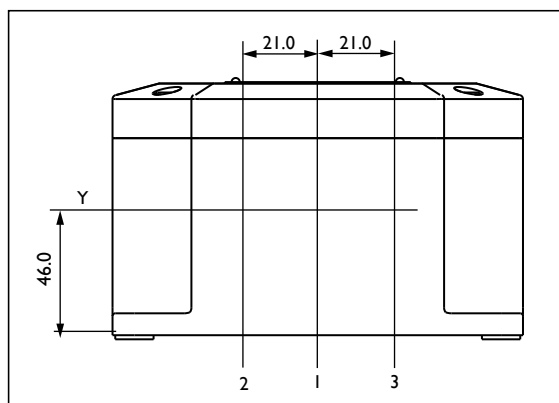
Note : Non-standard/mixed entry positions may be available. Please contact Hawke Sales.



All Dimensions in millimetres.

PL615 CABLE GLAND ENTRY POSITIONS			
Entries Per Face	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)		
	M16/M20	M25	M32
1	1Y	1Y	1Y
2	2Y 3Y	2Y 3Y	-

Note : Non-standard/mixed entry positions may be available. Please contact Hawke Sales.



All Dimensions in millimetres.



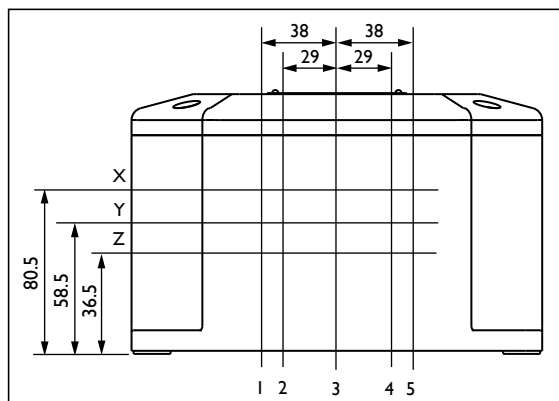
Cable Gland Entry Positions PL6 Series GRP Enclosures

Increased Safety EExe

PL6 Series Gland Entry Positions

PL620 CABLE GLAND ENTRY POSITIONS

Entries Per Face	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)			
	M16/20	M25	M32	M40/50
1	3Y	3Y	3Y	3Y*
2	2Y 4Y	2Y 4Y	2Y 4Y	-
3	2X 4X 3Z	2X 4X 3Z	-	-
4	2X 4X 2Z 4Z	2X 4X 2Z 4Z	-	-
5	1X 3Y 5X 1Z 5Z	-	-	-
6	1X 3X 5X 1Z 3Z 5Z	-	-	-



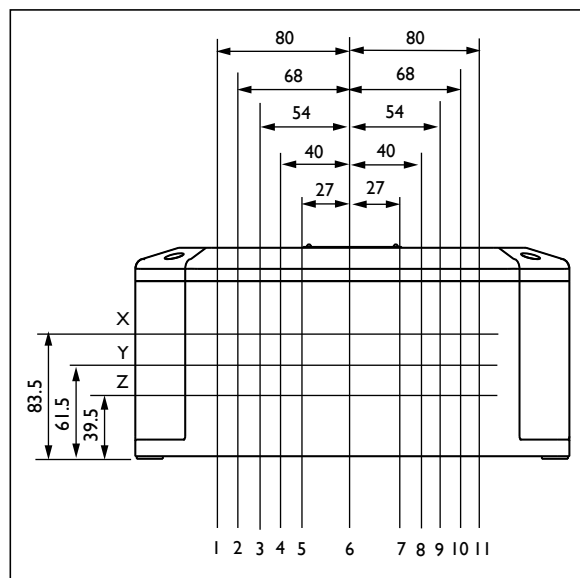
All Dimensions in millimetres.

* Continuity Plate not permitted.

Note : Non-standard/mixed entry positions may be available.
Please contact Hawke Sales.

PL630 CABLE GLAND ENTRY POSITIONS

Entries Per Face	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)				
	M16/M20	M25	M32 or M40	M50 or M63*	M75*
1	6Y	6Y	6Y	6Y	6Y
2	3Y 9Y	3Y 9Y	3Y 9Y	3Y 9Y	-
3	2Y 6Y 10Y	2Y 6Y 10Y	2Y 6Y 10Y	-	-
4	1Y 5Y 7Y 11Y	1Y 5Y 7Y 11Y	-	-	-
5	1Y 4Y 5Y 8Y 11Y	1X 6Y 11X 1Z 11Z	-	-	-
6	1X 6X 11X 1Z 6Z 11Z	1X 6X 11X 1Z 6Z 11Z	-	-	-
7	Select from below	Select from below	-	-	-
8	1X 5X 7X 11X 1Z 5Z 7Z 11Z	1X 5X 7X 11X 1Z 5Z 7Z 11Z	-	-	-
9	Select from below	-	-	-	-
10	1X4X6X8X11X 1Z4Z6Z8X11Z	-	-	-	-



All Dimensions in millimetres.

* Continuity Plate not permitted.

Note : Non-standard/mixed entry positions may be available.
Please contact Hawke Sales.



Technical Information

PL6 Series GRP Enclosures

PL6 Series GRP Enclosures

General

These enclosures are a self coloured black anti-static glass reinforced polyester design that meet the requirements of EExe to EN50014 & EN50019.

The PL6 Series enclosures are of a robust design with a very high impact strength of up to 20Nm and have excellent electrical insulation properties.

Application

These enclosures may be supplied with fitted terminals or as an empty component approved enclosure. If supplied as the latter, then final certification by the customer after fitting their own equipment must be obtained. In this case the prefix 'Z' is used ie. ZPL612.

Specification

Certification : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> I12 GD EExe II. (<input checked="" type="checkbox"/> and <input checked="" type="checkbox"/> options available).
Zones of Use : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Zone I, Zone 2, Zone 21 & Zone 22.
Temperature Class & Ambients : <input type="checkbox"/>	T6 40°C as standard. Optional T5 with ambients up to 65°C.
Operating Temperature Range : <input type="checkbox"/>	-60°C to +75°C.
Degree of Protection : <input type="checkbox"/> <input type="checkbox"/>	IP66, IP67 and Deluge proof to DTS01.
Material : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Glass Reinforced Polyester. Flame Retardant to (IEC92.1 clause 2.38).
Finish : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Natural Black.
Impact Resistance : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Up to 20Nm.
Weatherproofing : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	By captive moulded clear silicone gasket.
Certification Label : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel or optional certified self adhesive foil.
Lid Fixing Screws : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel (complete with nylon retaining washer).
Additional Options : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Breather/Drain devices. Internal/external earth stud.
Additional Labels : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Epoxy paint finish for colour coding. EMI/RFI coating for EMC requirements.
	Stainless Steel or laminated plastic (traffolyte) for external use only or optional (certified) self adhesive foil for external and/or internal use.

Earth Continuity

These enclosures may be fitted with an earth continuity plate in plated mild steel as standard or optional brass when requested by the customer. (Note: A locknut is required on cable glands and metal stopping plugs to ensure earth continuity through the plate).

Technical Notes

- To ensure that the maximum temperature as permitted by certification is not exceeded, the Dissipated Wattage Factor Formula is used : $W = N \times F \times I^2$. (See page 38 for enclosure wattage).
- It is not permitted to fit more than one conductor per side in rail or direct mounted terminals unless using an insulated Bootlace Ferule.
- Different quantities of terminals. Linked and mixed terminal arrangements other than those specified in the data tables are available but the voltage and current figures will be affected to ensure the maximum certified wattage factor is not exceeded. Please contact Hawke Technical Sales.
- When connecting a terminal with a conductor that is less than maximum size permitted for that terminal type, the maximum amps per pole must be reduced to suit. i.e. an RM10 (10mm²) terminal fitted with a 4mm² conductor will have the current rating reduced to that of the current rating permitted through the RM4 (4mm²) terminal.
- For Intrinsically Safe Applications, EExe power terminals can be supplied in blue on request. (Note: the enclosure will remain EExe certified).
- An earth terminal must be fitted inside the enclosure in accordance with EN 50014 : 1997 : clause 15.4. (Note: Power terminals may be used as 'clean earths').
- The enclosure has tapped Metric entry threads as standard. Alternative parallel threads are available provided they are to a recognised standard eg. BSPP, ET etc. Tapered threads are not permitted in plastic enclosures due to risk of stress cracking.
- The customer may drill and tap entry holes in the enclosure providing they are in accordance with the relevant code of practice and comply with the details shown in this catalogue.
- When mixed entries are accommodated on a face they must be in the positions shown in this catalogue for the largest gland entry on that face. For complex mixed entries contact Hawke Technical Sales.
- Entries into the enclosure must be via a suitable approved entry device.
- All unused entry holes must be fitted with a stopping plug as listed on the enclosures 'ATEX' certificate only.

PL7 series



PL7 Series





Glass Reinforced Polyester PL7 Series Enclosures

Increased Safety EExe



PL7 Series Enclosures

Features

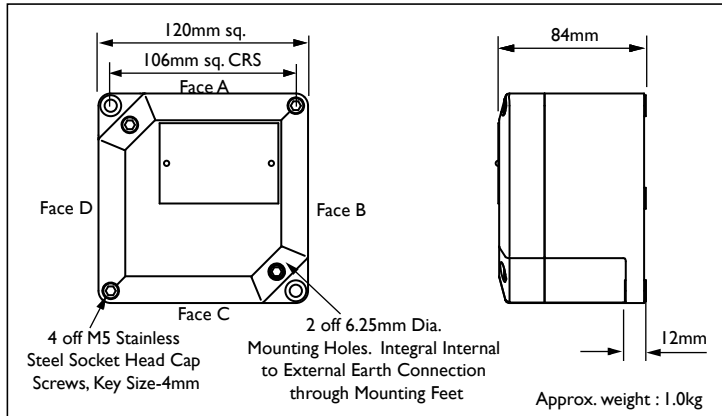
- The Ultimate in Robust GRP Construction**
 Designed to withstand impact resistance up to 20Nm.
 GRP Construction provides a high degree of resistance to corrosive atmospheres.
- Integral Steel Earth Continuity Plate**
 Provides internal/external earth continuity through to the two external mounting feet.
- Anti-Static Properties**
 Removes the risk of ignition sources through static induced sparking resistivity.
 Insulation Resistance in accordance with EN 50014 : 1998, which does not exceed 1 GΩ.
- External Mounting Feet**
 Eliminates the need to remove the lid when mounting the enclosure on the wall.
- Corrosion Resistant Stainless Steel Lid Fixing Screws with Nylon Retaining Washers**
 Prevents loss of screws during assembly and maintenance.
- One Piece Durable Captive Moulded Silicone Gasket**
 DTS01 deluge protection witnessed by EECs.
 Provides Ingress Protection to IP66.
 Optimum performance at low and high temperature extremes.
- Stainless Steel Rating Label**
 Highly durable and corrosion resistant.



Enclosure Type

Glass Reinforced Polyester PL712

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16/M20	M25	M32
Quantity	3	2	1

Note: For Cable Entry Positions see page 19.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- PL712 BASEEFA Certificate No. BAS 01 ATEX 2108X.
- ZPL712 BASEEFA Certificate No. BAS 01 ATEX 2102U.
- Suitable for use in Zone I, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -20°C to +75°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 273. For PL712.
- Assembly instruction data sheet No. A.I. 272. For ZPL712.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 20.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps		
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps	
WDU 2.5N	0.5	2.5	420	12	14	5	21	
WDU 2.5	0.5	2.5	550	10	16	6	21	
WDU 4	0.5	4	750	10	20	5	28	
WDU 6	0.5	6	550	7	30	4	36	
WDU 10	1.5	10	550	6	40	4	50	
BK6	1	4	275	1	21	N/A	N/A	
MK6/6	1	6	420	1	26	N/A	N/A	
HTB6	0.5	Max. Per Pillar: 2 × 10mm ² 3 × 6mm ² 4 × 4mm ² 4 × 0.5mm ² MIN	550	1	Conductor Size mm ²	Max Amps Per Pillar	N/A	N/A
					0.5	1		
					0.75	1		
					1	8		
					1.5	10		
					2.5	15		
					4	21		
					6	26		
					10	37		

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

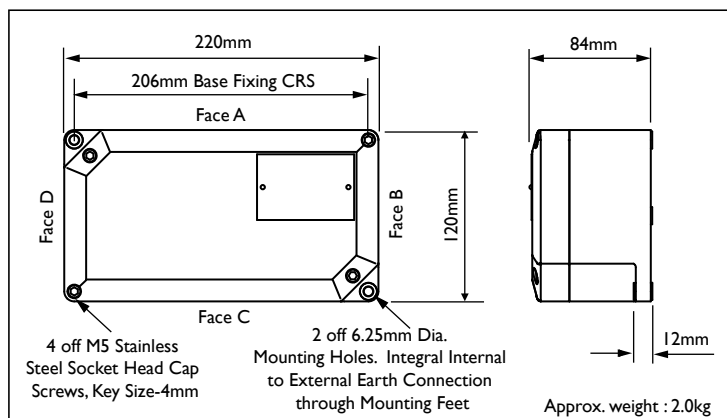
☐ An earth terminal equal to that of the largest power terminal will be fitted.



Enclosure Type

Glass Reinforced Polyester PL722

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE				
Thread Size	M16/M20	M25	M32	
Top & Bottom Faces A & C Quantity	6	4	3	
Side Faces B & D Quantity	3	2	1	

Note: For Cable Entry Positions see page 19.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- PL722 BASEEFA Certificate No. BAS 01 ATEX 2108X.
- ZPL722 BASEEFA Certificate No. BAS 01 ATEX 2102U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -20°C to +75°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction sheet No. A.I. 273. For PL722.
- Assembly instruction sheet No. A.I. 272. For ZPL722.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 20.

TERMINAL CAPACITY DATA							
Terminal Type	Conductor Size (mm²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	35	9	6	21
WDU 4	0.5	4	750	29	12	5	28
WDU 6	0.5	6	550	22	17	5	36
WDU 10	1.5	10	550	17	25	4	50

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.
☐ An earth terminal equal to that of the largest power terminal will be fitted.



Cable Gland Entry Positions PL7 Series GRP Enclosures

Increased Safety EExe

PL7 Series Gland Entry Positions

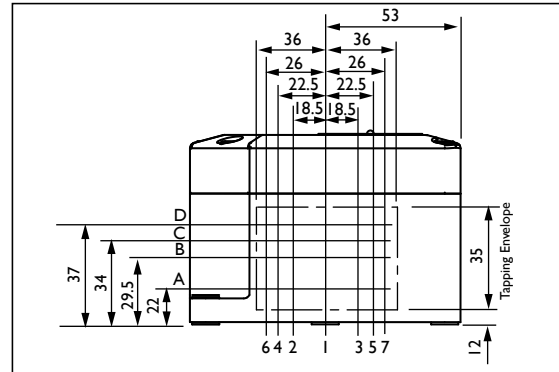
PL712 CABLE GLAND ENTRY POSITIONS			
Entries Per Faces B & D	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Thread or Smaller Permissible)		
	M16/M20	M25	M32
1	C1	C1	B1 #
2	C2 C3	C4 C5 ~	-
3	D6 A1 D7 *	-	-

* Maximum locknut size = 24 Across Flats.

~ Maximum locknut size = 30 Across Flats.

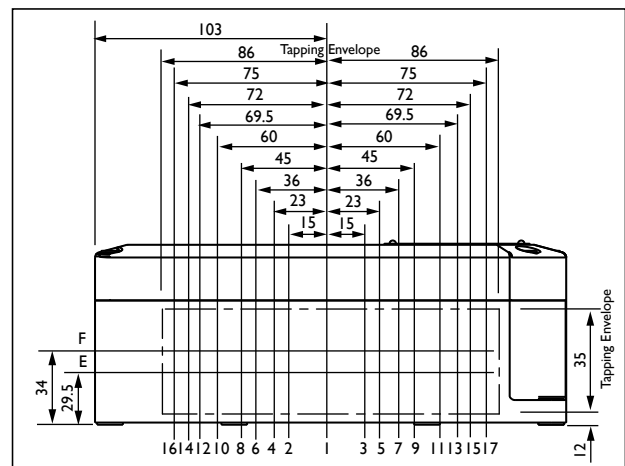
Locknut not permitted.

Note : Non-standard/mixed entry positions may be available. Please contact Hawke Sales.



All Dimensions in millimetres.

PL722 CABLE GLAND ENTRY POSITIONS			
Entries Per Faces A & C	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)		
	M16/M20	M25	M32
1	F1	F1	E1
2	Select From below	Select From below	Select From below
3	1F 10F 11F	1F 10F 11F	1E 10E 11F
4	4F 5F 12F 13F	4F 5F 12F 13F ~	-
5	1F 6F 7F 12F 13F *	-	-
6	2F 3F 8F # 9F 16F 17F \$	-	-



All Dimensions in millimetres.

PL722 CABLE GLAND ENTRY POSITIONS			
Entries Per Faces B & D	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Thread or Smaller Permissible)		
	M16/M20	M25	M32
1	C1	C1	B1 #
2	C2 C3	C4 C5 ~	-
3	D6 A1 D7 *	-	-

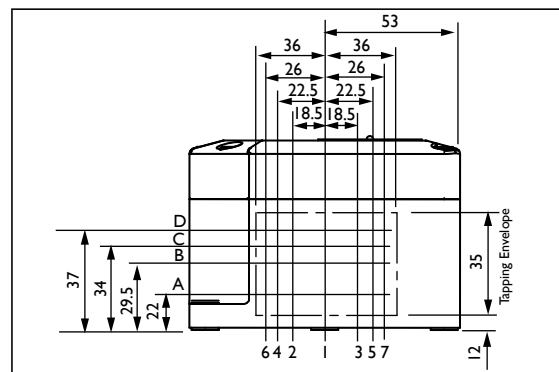
\$ Maximum 24mm across flats glands only (i.e. 'O' size glands only)

* Maximum locknut size = 24 Across Flats.

~ Maximum locknut size = 30 Across Flats.

Locknut not permitted.

Note : Non-standard/mixed entry positions may be available. Please contact Hawke Sales.



All Dimensions in millimetres.



Technical Information

PL7 Series GRP Enclosures

General

These enclosures are a self coloured black anti-static glass reinforced polyester design with integral continuity plate that meet the requirements of EExe to EN50014 & EN50019.

The PL7 Series enclosures are of a robust design with a very high impact strength of up to 20Nm and have excellent electrical insulation properties.

Application

These enclosures may be supplied with fitted terminals or as an empty component approved enclosure. If supplied as the latter, then final certification by the customer after fitting their own equipment must be obtained. In this case the prefix 'Z' is used ie. ZPL712.

Specification

Certification : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> II2 GD EExe II. (<input checked="" type="checkbox"/> and <input checked="" type="checkbox"/> options available).
Zones of Use : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Zone 1, Zone 2, Zone 21 & Zone 22.
Temperature Class & Ambients : <input type="checkbox"/>	T6 40°C as standard. Optional T5 with ambients up to 65°C.
Operating Temperature Range : <input type="checkbox"/>	-20°C to +75°C.
Degree of Protection : <input type="checkbox"/> <input type="checkbox"/>	IP66 and Deluge proof to DTS01.
Material : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Glass Reinforced Polyester. Flame Retardant to (IEC92.1 clause 2.38).
Finish : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Natural Black.
Impact Resistance : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Up to 20Nm.
Weatherproofing : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	By captive moulded clear silicone gasket.
Certification Label : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel or optional certified self adhesive foil.
Lid Fixing Screws : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel (complete with nylon retaining washer).
Additional Options : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Breather/Drain devices. Internal/external earth stud if not using earth/mounting feet.
Additional Labels : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Epoxy paint finish for colour coding. EMI/RFI coating for EMC requirements.
	Stainless Steel or laminated plastic (traffolyte) for external use only or optional (certified) self adhesive foil for external and/or internal use.

Earth Continuity

These enclosures have an integral earth continuity plate in plated mild steel as standard with option for brass. The continuity plate is moulded into the inside faces of the enclosure to give electrical continuity between the cable gland entries. The plate extends through the wall of the enclosure to the external mounting feet providing internal to external earthing as well as additional mechanical strength. There is assured earthing for the gland entry via the tapped hole in the continuity plate without the need for a locknut.

Technical Notes

- To ensure that the maximum temperature as permitted by certification is not exceeded, the Dissipated Wattage Factor Formula is used : $W = N \times F \times I^2$. (See page 38 for enclosure wattage).
- It is not permitted to fit more than one conductor per side in rail or direct mounted terminals unless using an insulated Bootlace Ferule.
- Different quantities of terminals. Linked and mixed terminal arrangements other than is specified in the data tables are available but the voltage and current figures will be affected to ensure the maximum certified wattage factor is not exceeded. Please contact Hawke Technical Sales.
- When connecting a terminal with a conductor that is less than maximum size permitted for that terminal type, the maximum amps per pole must be reduced to suit. i.e. an RM10 (10mm)² terminal fitted with a 4mm² conductor will have the current rating reduced to that of the current rating permitted through the RM4 (4mm²) terminal.
- For Intrinsically Safe Applications, EExe power terminals can be supplied in blue on request. (Note: the enclosure will remain EExe certified).
- An earth terminal must be fitted inside the enclosure in accordance with EN 50014 : 1997 : clause 15.4. (Note: Power terminals may be used as 'clean earths').
- The enclosure has tapped Metric entry threads as standard. Alternative parallel threads are available provided they are to a recognised standard eg. BSPP, ET etc. Tapered threads are not permitted in plastic enclosures due to risk of stress cracking.
- The customer may drill and tap entry holes in the enclosure providing they use a special stepped drill available from Hawke, and the holes are in accordance with the relevant code of practice and comply with the details shown in this catalogue.
- When mixed entries are accommodated on a face they must be in the positions shown in this catalogue for the largest gland entry on that face. For complex mixed entries contact Hawke Technical Sales.
- Entries into the enclosure must be via a suitable approved entry device.
- All unused entry holes must be fitted with a stopping plug as listed on the enclosures 'ATEX' certificate only.

S series



S Series





S Series Stainless Steel Enclosures

Increased Safety EExe

S Series Stainless Steel Enclosures



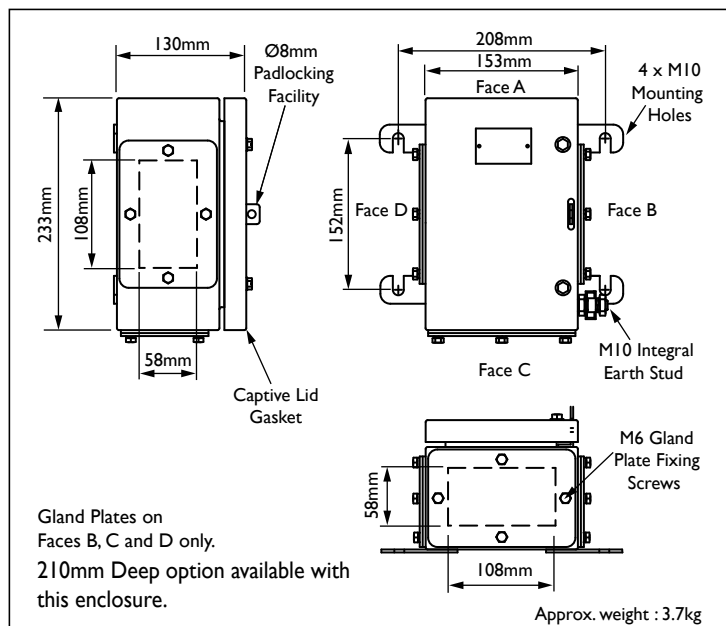
Features

- Robust Stainless Steel Construction**
 Enclosure material thickness ranges between 1.2 - 2.0mm with 3mm thick gland plates.
 Durable stainless steel rating label.
- Electropolished Surface Finish**
 Provides high levels of corrosion resistance.
- Softer Finished Rounded Edges**
 Safer manual handling of enclosure and gland plates.
- Rigid Slotted External Mounting Feet**
 Allows enclosure to be hung onto the structure.
- Stainless Steel Lid Fixing Screws with Nylon Retaining Washers**
 Prevents loss of screws during assembly and maintenance.
- Superior Silicone Sponge Gasket**
 DTS01 deluge protection witnessed by EECs.
 Provides ingress protection to IP66.
 Durable with excellent UV stability and chemical resistance.
 Good chemical resistance - EMC mesh option.
- Extensive Range of Enclosure Sizes Available**
 Nine enclosure sizes available. Sizes range from 153 x 233 x 130 to 740 x 1000 x 210.
 Gland plates offered on two sides (Faces B & D) and bottom (Face C) of each enclosure.



Enclosure Type Stainless Steel Size I Increased Safety EExe

S Series Stainless Steel Enclosures



Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- SIZE I BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE I BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone I, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE I.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE I.
- 210mm deep option available.
- Alternative Certification Options Available.

Exe II.

AExe II/Exe II.

For full Technical Specification see page 35.

MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32
Quantity	5 #	5 #	3	2	1

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 32.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	30	13	12	21
WDU 4	0.5	4	750	25	18	11	28
WDU 6	0.5	6	550	19	26	10	36
WDU 10	1.5	10	550	15	38	8	50
WDU 16	1.5	16	550	13	51	7	66
WDU 35	2.5	35	750	9	90	6	109

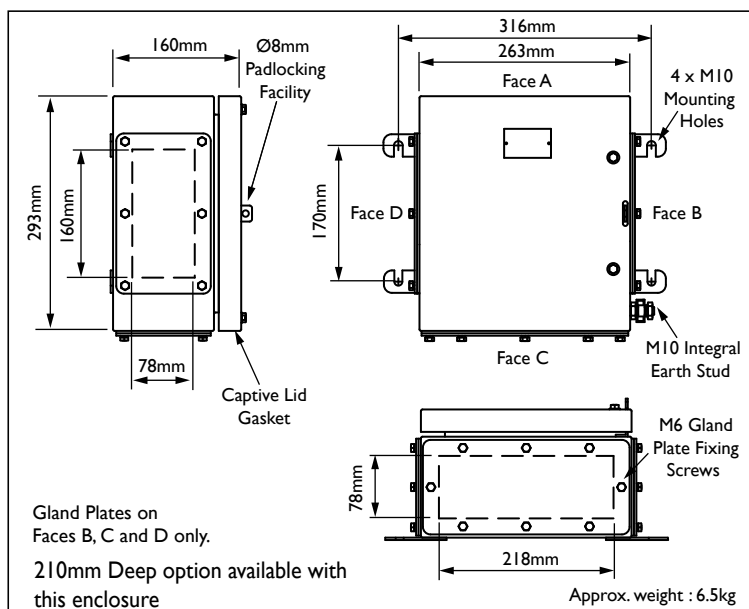
Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ The box is supplied with an integral internal/external earth stud assembly.



Enclosure Type Stainless Steel Size 2 Increased Safety EExe

S Series Stainless Steel Enclosures



Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- SIZE 2 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 2 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone I, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 2.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 2.
- 210mm deep option available.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 35.

MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50
Bottom Face C Quantity	17#	17#	12	6	4	3	2 *
Side Faces B & D Quantity	11#	11#	8	4	2	2	1 *

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 32.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	60	9	12	21
WDU 4	0.5	4	750	50	13	11	28
WDU 6	0.5	6	550	42	17	10	36
WDU 10	1.5	10	550	36	24	8	50
WDU 16	1.5	16	550	28	34	7	66
WDU 35	2.5	35	750	20	60	6	109
WDU 70N	10	70	750	8	117	3	167
WFF 35	2.5	35	1100	6	107	5	109

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

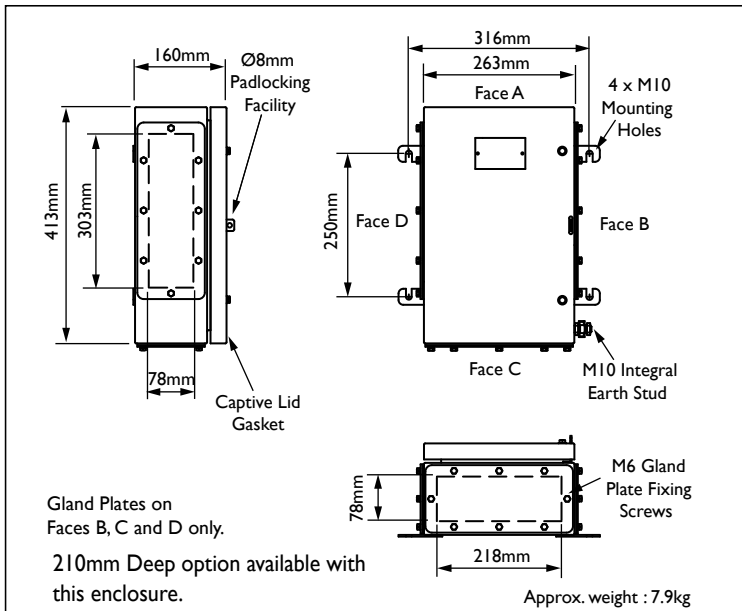
☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 3 Increased Safety EExe

S Series Stainless Steel Enclosures



Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- SIZE 3 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 3 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone I, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 3.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 3.
- 210mm deep option available.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 35.

MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50
Bottom Face C Quantity	17 #	17 #	12	6	4	3	2 *
Side Faces B & D Quantity	23 #	23 #	16	8	5	4	3 *

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see pages 32 - 33.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	112	7	13	21
WDU 4	0.5	4	750	94	10	12	28
WDU 6	0.5	6	550	72	14	10	36
WDU 10	1.5	10	550	56	20	9	50
WDU 16	1.5	16	550	48	27	8	66
WDU 35	2.5	35	750	36	47	6	109
WDU 70N	10	70	750	14	94	4	167
WFF 35	2.5	35	1100	11	83	6	109

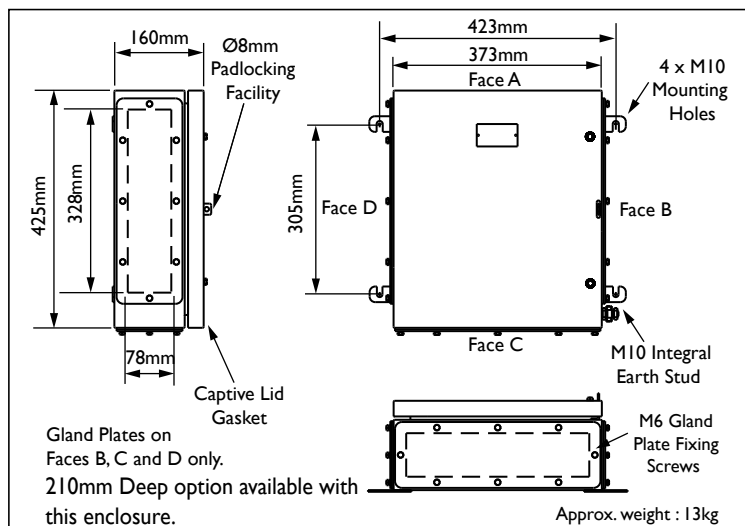
Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 4 Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50
Faces B, C & D Quantity	26 #	26 #	18	9	6	4	4 *

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 33.

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- SIZE 4 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 4 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 4.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 4.
- 210mm deep option available.
- Alternative Certification Options Available.

• Exe II.

• AExe II/Exe II.

For full Technical Specification see page 35.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	168	6	15	21
WDU 4	0.5	4	750	141	8	13	28
WDU 6	0.5	6	550	108	12	12	36
WDU 10	1.5	10	550	84	17	10	50
WDU 16	1.5	16	550	72	24	9	66
WDU 35	2.5	35	750	54	40	7	109
WDU 70N	10	70	750	30	69	5	167
WDU 70/95	16	70	750	15	96	3	202
WDU 70/95	16	95		15	107	4	
WDU 120/150	35	120	1100	9	149	3	234
WDU 120/150		150		9	158	4	
WFF 35	2.5	35	1100	11	89	7	109
WFF 70	2.5	70	1100	9	134	5	167
WFF 120	6	120	1100	7	198	5	234

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

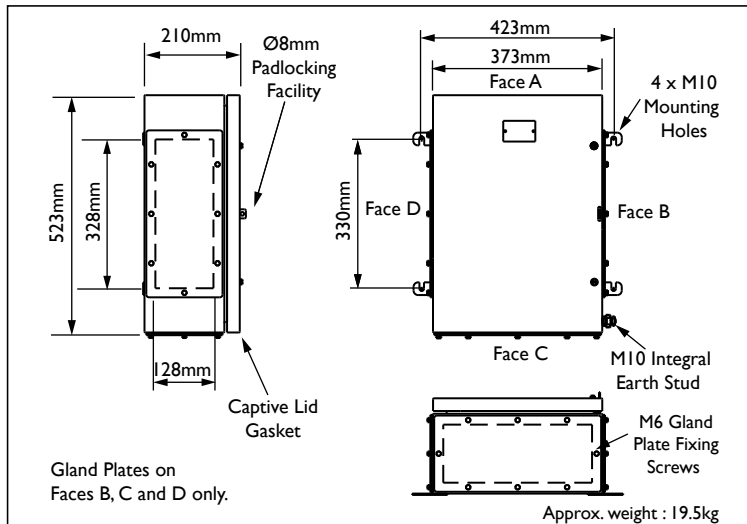
☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 5 Increased Safety EExe

S Series Stainless Steel Enclosures



Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- SIZE 5 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 5 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction sheet No. A.I. 266. For SIZE 5.
- Assembly instruction sheet No. A.I. 267. For ZSIZE 5.
- Alternative Certification Options Available.
 - Ex II.
 - AExe II/Exe II .

For full Technical Specification see page 35.

MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50	M63	M75
Faces B, C & D Quantity	40#	40#	24	20	10	8#*	5*	3	2

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 34.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	228	5	14	21
WDU 4	0.5	4	750	192	7	13	28
WDU 6	0.5	6	550	144	10	11	36
WDU 10	1.5	10	550	120	14	10	50
WDU 16	1.5	16	550	96	20	9	66
WDU 35	2.5	35	750	72	34	7	109
WDU 70N	10	70	750	40	60	5	167
WDU 70/95	16	70	750	15	96	3	202
WDU 70/95	16	95		15	107	4	
WDU 120/150	35	120	1100	12	130	3	234
WDU 120/150		150		12	138	4	
WFF 35	2.5	35	1100	15	75	7	109
WFF 70	2.5	70	1100	12	114	5	167
WFF 120	6	120	1100	9	173	4	234

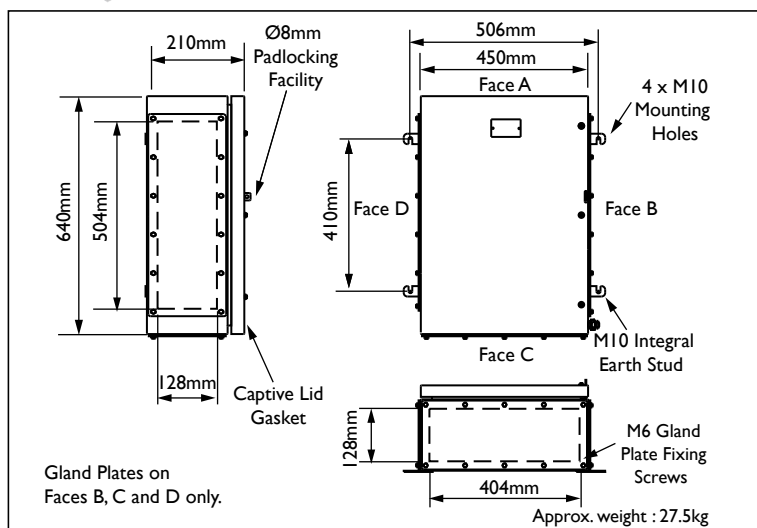
Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 6 Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50	M63	M75
Bottom Face C Quantity	44#	44#	30	21	14	9	6	4	3
Side Faces B & D Quantity	56#	56#	36	26	16	11	7	5	4

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 34.

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- SIZE 6 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 6 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 6.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 6.
- Alternative Certification Options Available.

• Exe II.

• US AExe II/Exe II.

For full Technical Specification see page 35.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	380	4	14	21
WDU 4	0.5	4	750	320	5	13	28
WDU 6	0.5	6	550	240	8	12	36
WDU 10	1.5	10	550	200	11	10	50
WDU 16	1.5	16	550	160	16	9	66
WDU 35	2.5	35	750	120	27	7	109
WDU 70N	10	70	750	50	55	5	167
WDU 70/95	16	70	750	19	87	3	202
WDU 70/95	16	95		19	99	4	
WDU 120/150	35	120	1100	16	117	4	234
WDU 120/150		150		16	125	4	
WFF 35	2.5	35	1100	38	48	7	109
WFF 70	2.5	70	1100	16	101	5	167
WFF 120	6	120	1100	12	153	5	234
WFF 185	10	185	1100	9	212	4	307
WFF 300	25	300	1100	9	236	2	452

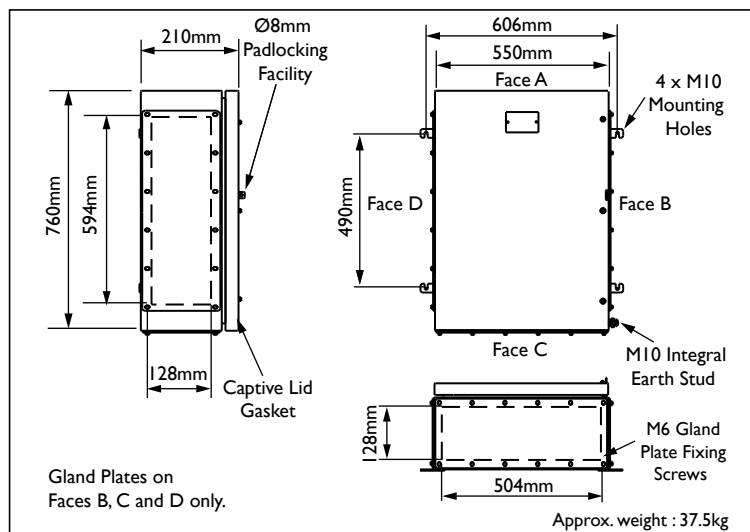
Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 7 Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50	M63	M75
Bottom Face C Quantity	56 #	56 #	36	26	16	11	7	5	4
Side Faces B & D Quantity	64 #	64 #	42	30	18	13	8	6	4

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 34.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- SIZE 7 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 7 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECs.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 7.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 7.
- Alternative Certification Options Available.
 - Exe II.
 - AExe II/Exe II.

For full Technical Specification see page 35.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	600	3	16	21
WDU 4	0.5	4	750	550	4	14	28
WDU 6	0.5	6	550	380	6	13	36
WDU 10	1.5	10	550	300	9	11	50
WDU 16	1.5	16	550	250	13	10	66
WDU 35	2.5	35	750	190	22	8	109
WDU 70N	10	70	750	93	42	6	167
WDU 70/95	16	70	750	23	84	4	202
WDU 70/95	16	95		23	96	5	
WDU 120/150	35	120	1100	20	112	4	234
WDU 120/150		150		20	121	5	
WFF 35	2.5	35	1100	46	45	8	109
WFF 70	2.5	70	1100	40	67	6	167
WFF 120	6	120	1100	15	145	5	234
WFF 185	10	185	1100	11	203	4	307
WFF 300	25	300	1100	11	227	2	452

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

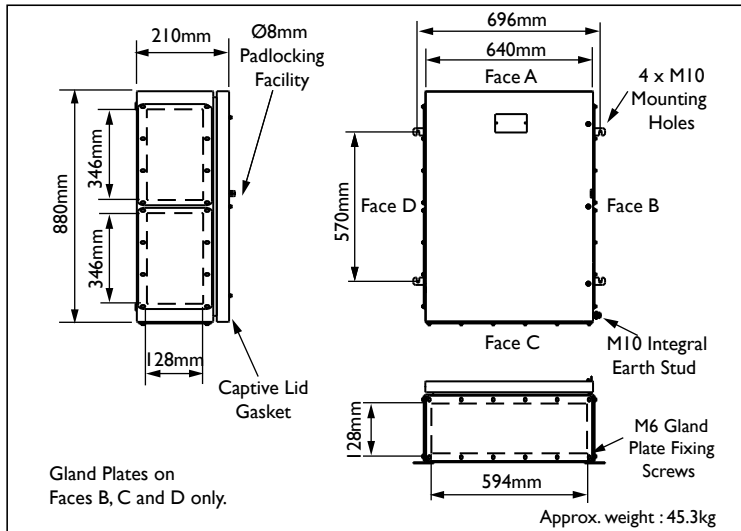
☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 8 Increased Safety EExe

S Series Stainless Steel Enclosures



MAXIMUM QUANTITY OF ENTRIES PER FACE (2 gland plates on faces B & D)

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50	M63	M75
Bottom Face C Quantity	64 #	64 #	42	30	18	13	8	6	4
Side Faces B & D Quantity	128 #	128 #	84	60	36	26	16	12	8

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 34.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- SIZE 8 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 8 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 8.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 8.
- Alternative Certification Options Available.
- Exe II.
- AExe II/Exe II.

For full Technical Specification see page 35.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	852	3	17	21
WDU 4	0.5	4	750	720	4	16	28
WDU 6	0.5	6	550	540	5	14	36
WDU 10	1.5	10	550	438	8	12	50
WDU 16	1.5	16	550	360	11	11	66
WDU 35	2.5	35	750	270	20	9	109
WDU 70N	10	70	750	108	41	6	167
WDU 70/95	16	70	750	56	57	4	202
WDU 70/95	16	95		56	65	5	
WDU 120/150	35	120	1100	46	78	5	234
WDU 120/150		150		46	85	6	
WFF 35	2.5	35	1100	84	35	8	109
WFF 70	2.5	70	1100	46	66	7	167
WFF 120	6	120	1100	36	98	6	234
WFF 185	10	185	1100	13	197	5	307
WFF 300	25	300	1100	13	221	3	452

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

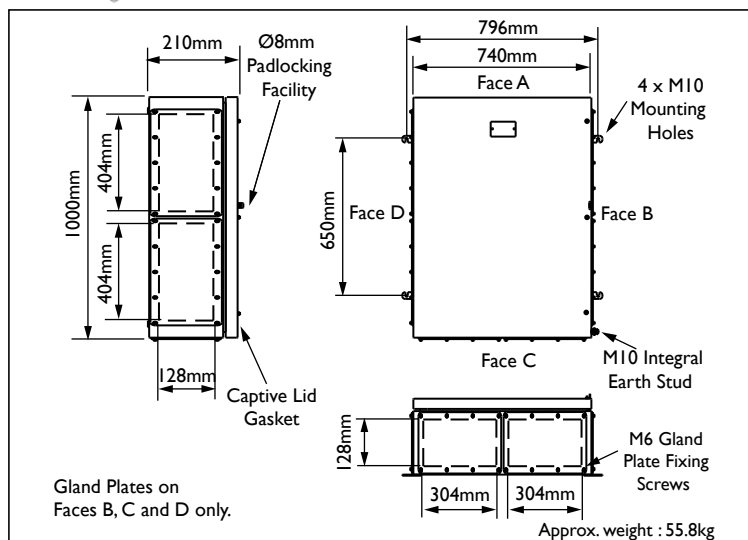
☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



Enclosure Type Stainless Steel Size 9

Increased Safety EExe



MAXIMUM QUANTITY OF ENTRIES PER FACE (2 gland plates per face)

Thread Size	M16	M20/O	M20/A	M25	M32	M40	M50	M63	M75
Bottom Face C Quantity	64#*	64#*	42	30	20	12	8	6	4
Side Faces B & D Quantity	88#*	88#*	60	42	28	18	12	8	6

Serrated Washers/Locknuts with large outside diameters may foul on adjacent glands.

* Serrated Washers/Locknuts must not foul on aperture wall.

Note: For Cable Entry Positions see page 34.

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- SIZE 9 BASEEFA Certificate No. BAS 01 ATEX 2106X.
- ZSIZE 9 BASEEFA Certificate No. BAS 01 ATEX 2105U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C.
- Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.
- Assembly instruction data sheet No. A.I. 266. For SIZE 9.
- Assembly instruction data sheet No. A.I. 267. For ZSIZE 9.
- Alternative Certification Options Available.
 - Exe II.
 - US AExe II/Exe II.

For full Technical Specification see page 35.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm ²)		Max. Volts	Max. Physical Terminal Content		Reduced Terminal Content at Max. Terminal Amps	
	Min.	Max.		Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	1155	2	19	21
WDU 4	0.5	4	750	980	3	17	28
WDU 6	0.5	6	550	735	5	15	36
WDU 10	1.5	10	550	595	7	13	50
WDU 16	1.5	16	550	490	10	12	66
WDU 35	2.5	35	750	371	17	9	109
WDU 70N	10	70	750	172	34	7	167
WDU 70/95	16	70	750	64	56	4	202
WDU 70/95	16	95		64	64	6	
WDU 120/150	35	120	1100	54	76	5	234
WDU 120/150		150		54	82	6	
WFF 35	2.5	35	1100	96	34	9	109
WFF 70	2.5	70	1100	81	52	7	167
WFF 120	6	120	1100	42	94	6	234
WFF 185	10	185	1100	32	131	5	307
WFF 300	25	300	1100	32	147	3	452

Notes: ☐ For Junction Box Wattage Factor & Combined Terminal Resistance see pages 37 - 39.

☐ The box is supplied with an integral internal/external earth stud assembly.

☐ WFF terminals are supplied fitted with cover.



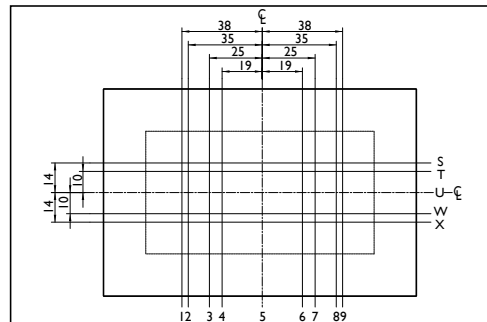
Cable Gland Entry Positions Stainless Steel Size I to 9

Increased Safety EExe

S Series Gland Entry Positions

SIZE I CABLE GLAND ENTRY POSITIONS (Faces B, C & D)		
Max. Entries	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)	
5	M16 M20/O	4S 6S 11X 5X 9X
3	M20/A	5T 2W 8W
2	M25	3U 7U
1	M32	5U

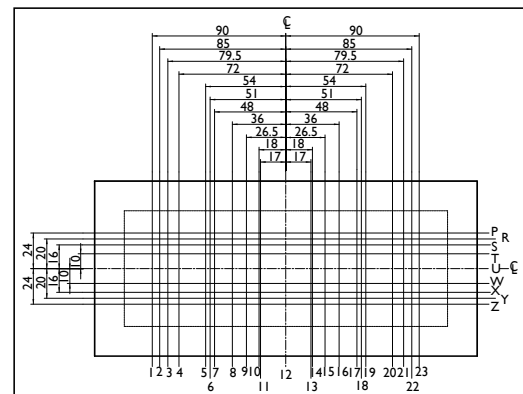
SIZE I GLAND PLATE : FACES B, C & D



All Dimensions in millimetres.
General Tolerance : ± 0.25 .

SIZE 2 & 3 CABLE GLAND ENTRY POSITIONS (Face C)		
Max. Entries	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)	
17	M16 M20/O	1P 5P 10P 14P 19P 23P 4U 8U 12U 16U 20U 1Z 5Z 10Z 14Z 19Z 23Z
12	M20/A	1R 5R 10R 14R 19R 23R 1Y 5Y 10Y 14Y 19Y 23Y
6	M25	2S 11S 18S 6X 13X 22X
4	M32	3T 15T 9W 21W
3	M40	4U 12U 20U
2	M50	7U 17U

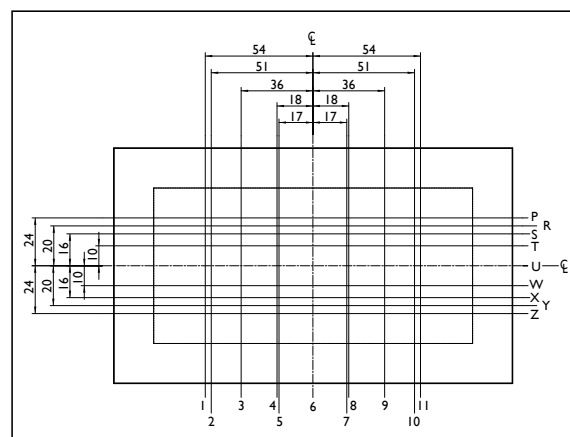
SIZE 2 & SIZE 3 GLAND PLATES : FACE C



All Dimensions in millimetres.
General Tolerance : ± 0.25 .

SIZE 2 CABLE GLAND ENTRY POSITIONS (Faces B & D)		
Max. Entries	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Threads or Smaller Permissible)	
11	M16 M20/O	1P 4P 8P 11P 3U 6U 8U 1Z 4Z 8Z 11Z
8	M20/A	1R 4R 8R 11R 1Y 4Y 8Y 11Y
4	M25	2S 7S 5X 10X
2	M32	3U 9U
2	M40	3U 9U
1	M50	6U

SIZE 2 GLAND PLATE : FACES B & D



All Dimensions in millimetres.
General Tolerance : ± 0.25 .

Entry Positions Based on Hawke Cable Glands -

M16/M20/O - 24.0 Across Flats, 27.7 Across Corners.
M20/A - 30.0 Across Flats, 34.6 Across Corners.
M25 - 36.0 Across Flats, 41.6 Across Corners.

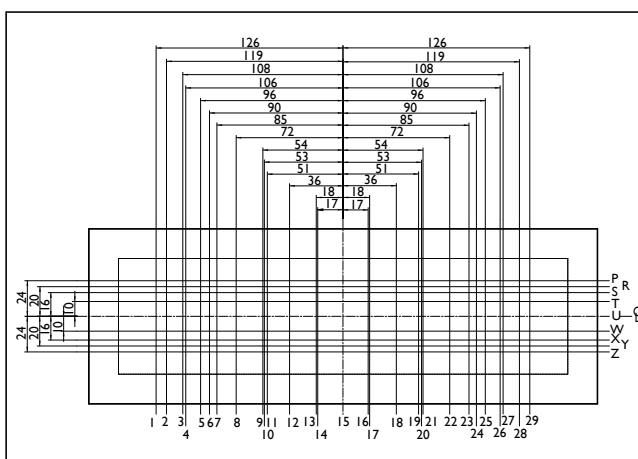
M32 - 46.0 Across Flats, 53.1 Across Corners.
M40 - 55.0 Across Flats, 63.5 Across Corners.
M50 - 65.0 Across Flats, 75.1 Across Corners.

Cable Gland Entry Positions Stainless Steel Size 1 to 9

Increased Safety EExe

SIZE 3 CABLE GLAND ENTRY POSITIONS (Faces B & D)			
Max. Entries	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Thread or Smaller Permissible)		
23	M16 M20/O	1P 6P 9P 13P 17P 21P 24P 29P 3U 8U 12U 15U 18U 22U 27U 1Z 6Z 9Z 13Z 17Z 21Z 24Z 29Z	
16	M20/A	1R 6R 9R 13R 17R 21R 24R 29R 1Y 6Y 9Y 13Y 17Y 21Y 24Y 29Y	
8	M25	2S 11S 16S 23S 7X 14X 19X 28X	
5	M32	4T 15T 26T 10W 20W	
4	M40	3U 12U 18U 27U	
3	M50	5U 15U 25U	

SIZE 3 GLAND PLATE : FACES B & D

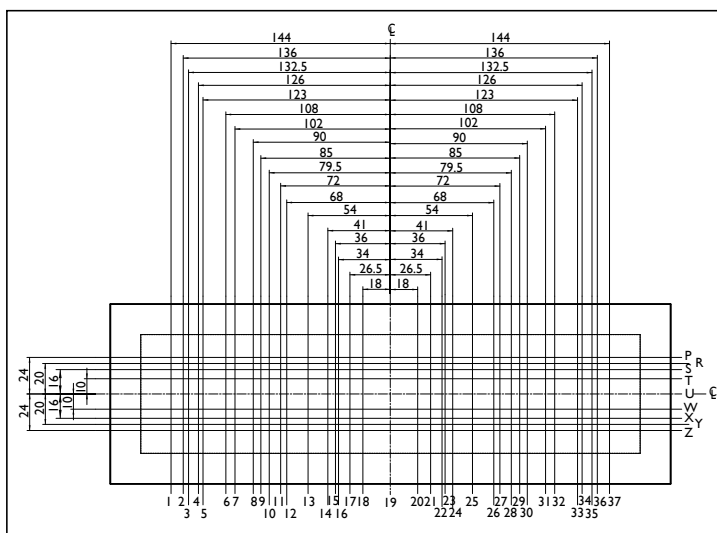


All Dimensions in millimetres.

General Tolerance : ± 0.25 .

SIZE 4 CABLE GLAND ENTRY POSITIONS (Faces B, C & D)		
Max. Entries	Standard Positions of Entries (Maximum Sizes Shown - Equivalent Parallel Thread or Smaller Permissible)	
26	M16 M20/O	1P 6P 11P 15P 19P 23P 27P 32P 37P 4U 8U 13U 18U 20U 25U 30U 34U 1Z 6Z 11Z 15Z 19Z 23Z 27Z 32Z 37Z
18	M20/A	1R 6R 11R 15R 19R 23R 27R 32R 37R 1Y 6Y 11Y 15Y 19Y 23Y 27Y 32Y 37Y
9	M25	2S 12S 19S 26S 36S 7X 16X 22X 31X
6	M32	3T 17T 28T 10W 21W 35W
4	M40	6U 15U 23U 32U
4	M50	5U 14U 24U 33U

SIZE 4 GLAND PLATE : FACES B,C & D



All Dimensions in millimetres.

General Tolerance : ± 0.25 .

Entry Positions Based on Hawke Cable Glands -

MI6/M20/0 - 24.0 Across Flats, 27.7 Across Corners.

M20/A - 30.0 Across Flats, 34.6 Across Corners.

M25 - 36.0 Across Flats, 41.6 Across Corners.

M32 - 46.0 Across Flats, 53.1 Across Corners.

M40 - 55.0 Across Flats, 63.5 Across Corners.

M50 - 65.0 Across Flats, 75.1 Across Corners.



Cable Gland Entry Positions Stainless Steel Size 5 to 9

Increased Safety EExe

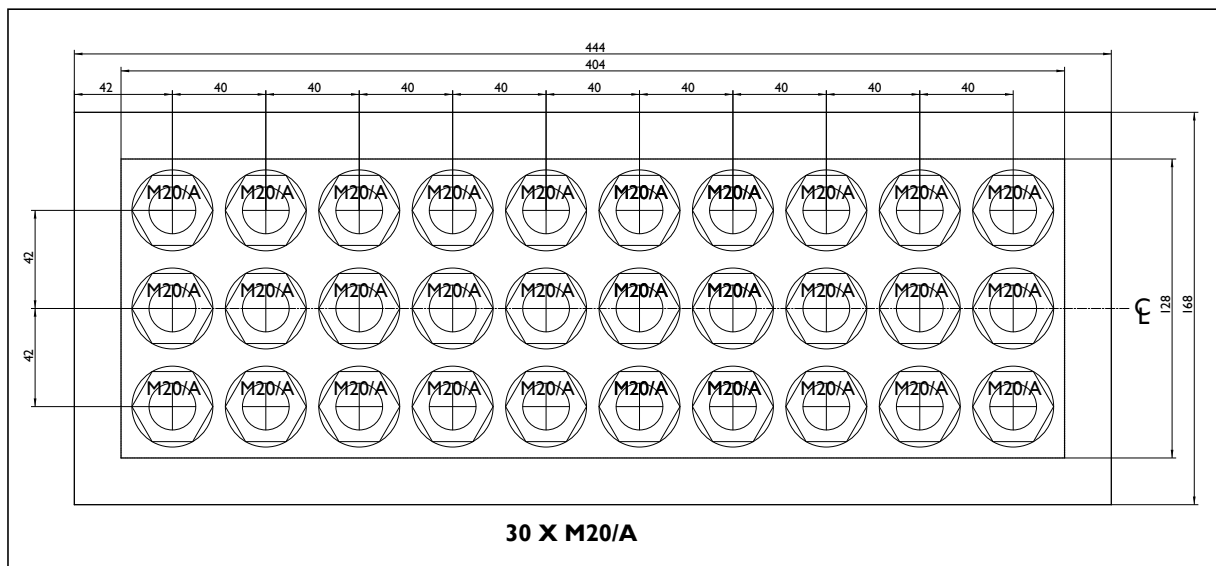
Size 5 to Size 9

For the above enclosures, which are 210mm deep as standard, detailed layouts of the entry quantities specified on the product data pages are available on request from Hawke Sales Department. Alternatively you could visit our website on www.ehawke.com.

Example of detailed layout, shown below :-

SIZE 6 : FACE C (1 PLATE PER FACE)

SIZE 9 : FACE B & D (2 PLATES PER FACE)



All Dimensions in millimetres.

General Tolerance : ± 0.25 .

Size 1 to 9 Enclosures

General Guide for Non-Standard Cable Entry Positions

Holes may be accommodated in the gland plates, provided the following is maintained :-

A minimum of 5mm of material is maintained between the gland plate holes, also the hole is no larger than 0.7mm above the major diameter of the entry thread and the following points are taken into consideration :-

- The distance between centres will clear the 'across corners' dimension of adjacent cable glands/locknuts.
- The distance from the hole centre to the edge of the box aperture must be sufficient to clear the 'across corners' of the cable gland/locknut.

Note : Entries may be possible in the lid and back panel of the enclosure body. Please contact Hawke Sales.



Technical Information

Stainless Steel Size I to 9

General

These enclosures are a stainless steel design that meet the requirements of EExe to EN50014 & EN50019. The material qualities and electropolished finish provides a very high corrosion resistance.

Application

These enclosures may be supplied with fitted terminals or as an empty component approved enclosure. If supplied as the latter, then final certification by the customer after fitting their own equipment must be obtained. In this case the prefix 'Z' is used ie. ZSIZE I.

Specification

Certification : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> II2 GD EExe II. (<input checked="" type="checkbox"/> and <input checked="" type="checkbox"/> options available).
Zones of Use : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Zone 1, Zone 2, Zone 21 & Zone 22.
Temperature Class & Ambients : <input type="checkbox"/>	T6 40°C as standard. Optional T5 with ambients up to 65°C.
Operating Temperature Range : <input type="checkbox"/>	-40°C to +80°C.
Degree of Protection : <input type="checkbox"/> <input type="checkbox"/>	IP66 and Deluge proof to DTS01.
Material : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel.
Finish : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Electropolished.
Impact Resistance : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	7Nm.
Weatherproofing : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	By bonded silicone sponge lid and gland plate gaskets.
Certification Label : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel or optional certified self adhesive foil.
Lid Fixing Screws : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel (complete with nylon retaining washer).
Additional Options : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Breather/Drain devices.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Epoxy paint finish for colour coding. EMI/RFI wire mesh on lid gasket for EMC requirements.
Additional Labels : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Stainless Steel or laminated plastic (traffolyte) for external use only or optional (certified) self adhesive foil for external and/or internal use.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Earth Continuity

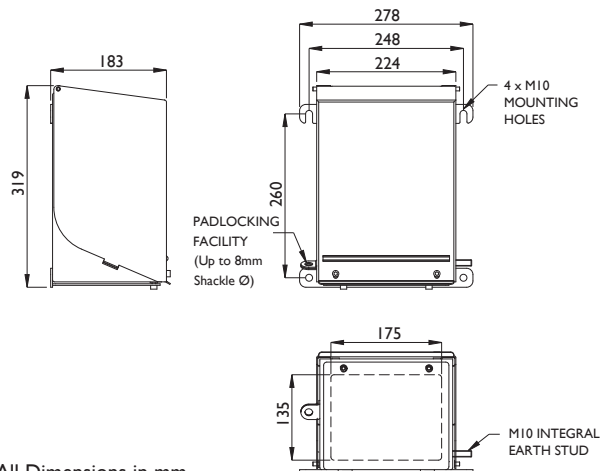
These enclosures have an integral internal/external earth stud assembly suitable for conductors up to 80mm².

Technical Notes

- To ensure that the maximum temperature as permitted by certification is not exceeded, the Dissipated Wattage Factor Formula is used : $W = N \times F \times I^2$. (See page 38 for enclosure wattage).
- It is not permitted to fit more than one conductor per side in rail or direct mounted terminals unless using an insulated Bootlace Ferule.
- Different quantities of terminals. Linked and mixed terminal arrangements other than is specified in the data tables are available but the voltage and current figures will be affected to ensure the maximum certified wattage factor is not exceeded. Please contact Hawke Technical Sales.
- When connecting a terminal with a conductor that is less than maximum size permitted for that terminal type, the maximum amps per pole must be reduced to suit. i.e. an RM10 (10mm)² terminal fitted with a 4mm² conductor will have the current rating reduced to that of the current rating permitted through the RM4 (4mm²) terminal.
- For Intrinsically Safe Applications, EExe power terminals can be supplied in blue on request. (Note: the enclosure will remain EExe certified).
- The enclosure is provided with an integral internal/external earth stud assembly, but when required, one or more rail mounted earth terminals may be fitted inside the enclosure but the quantity of power terminals shall be reduced accordingly. (Note: Power terminals may be used as 'clean earths').
- The enclosure has Metric clearance/plain entry holes as standard. Alternative clearance holes are available provided they are to a recognised standard eg. BSPP, ET etc. (Parallel threads only). Plain entry holes must maintain the following:
 - The plain hole shall be no larger than 0.7mm above the major diameter of the entry thread.
 - The gland or stopping plug is secured internally by a locknut, such that the gland or stopping plug will not be dislodged by a 7Nm impact.
 - The enclosure will be maintained at IP66 by a suitable sealing washer under the shoulder of the cable gland. (Note: Hawke does not recommend the use of cable glands with tapered threads in thin wall enclosures as the IP rating may be impaired).
- The customer may drill plain entry holes in the enclosure providing they are in accordance with the relevant code of practice and comply with the details shown in this catalogue.
- When mixed entries are accommodated on a face they must be in the positions shown in this catalogue for the largest gland entry on that face. For complex mixed entries contact Hawke Technical Sales.
- Entries into the enclosure must be via a suitable approved entry device.
- All unused entry holes must be fitted with a stopping plug as listed on the enclosures 'ATEX' certificate only. The stopping plug shall be held in place by a locknut.

EZE-22 Increased Safety EExe**EZE-22**

Registered Design.®



All Dimensions in mm.



Stainless Steel Grade: 316L

MAXIMUM QUANTITY OF ENTRIES

Thread Size	M16	M20/Os/O	M20/A	M25	M32	M40	M50
Bottom Face Quantity	20	20	14 (12*)	9 (8*)	6	4	2

*Recommended maximum for cable gland installation.

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II. EZE-22 Baseefa Certificate No. Baseefa 04 ATEX 0171X.
- EZI-22 (Empty) Baseefa Certificate No. Baseefa 04 ATEX 0171U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to $+80^{\circ}\text{C}$. Temperature Class and Ambient T6 40°C . Optional T5 with ambients up to 65°C .

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm²)		Max. Volts	Typical Terminal Arrangements					
	Min.	Max.		2 Vertical Rails		2 Vertical Rails		1 Vertical Rail	
				Terminal Quantity	Amps	Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	76	8	55	10	24	15
WDU 4	0.5	4	750	64	11	45	14	20	21
WDU 6	0.5	6	550	48	16	40	18	18	27
WDU 10	1.5	10	550	38	23	34	25	15	37
WDU 16	1.5	16	550	32	32	31	33	14	49
WDU 35	2.5	35	750	24	55	24	55	11	81

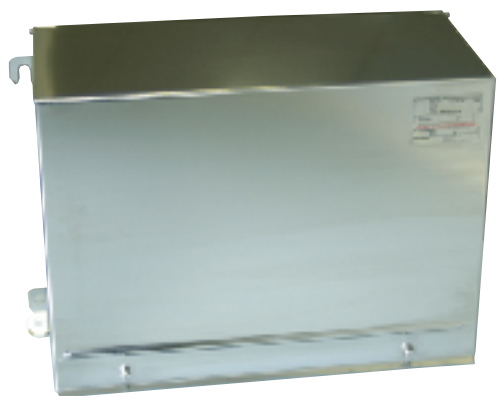
Information in the table above is based on the maximum conductor size permitted for the terminal.

Notes:

- A combination of different sized entries is possible, please contact Hawke for more information.
- The table above gives an indication of potential terminal arrangements. Please contact Hawke for information on other arrangements or empty enclosures.
- A combination of different sized terminals is possible, please contact Hawke for more information.
- Other terminal types are available.

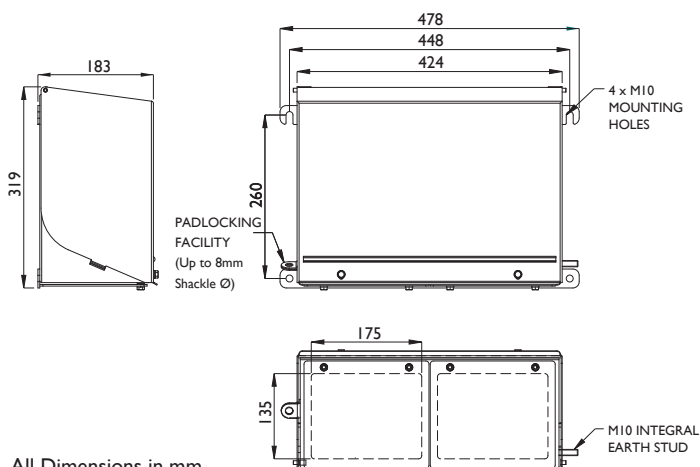
EZE-42

EZE-42 Increased Safety EExe



Stainless Steel Grade: 316L

Registered Design.®



MAXIMUM QUANTITY OF ENTRIES

Thread Size	M16	M20/Os/O	M20/A	M25	M32	M40	M50
Bottom Face Quantity	40	40	28 (24*)	18 (16*)	12	8	4

* Recommended maximum for cable gland installation.

Technical Data

- Increased Safety EExe. II 2 GD EExe II. EZE-42 Baseefa Certificate No. Baseefa 04 ATEX 0171X.
- EZI-42 (Empty) Baseefa Certificate No. Baseefa 04 ATEX 0171U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C. Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm²)		Max. Volts	Typical Terminal Arrangements					
	Min.	Max.		3 Vertical Rails		2 Vertical Rails		1 Vertical Rail	
				Terminal Quantity	Amps	Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	114	7	64	10	28	15
WDU 4	0.5	4	750	96	10	52	14	23	21
WDU 6	0.5	6	550	72	14	47	18	21	27
WDU 10	1.5	10	550	57	21	40(**)	25	18	37
WDU 16	1.5	16	550	48	29	37(**)	33	16	49
WDU 35	2.5	35	750	36	49	30(**)	54	13(***)	81

Information in the table above is based on the maximum conductor size permitted for the terminal.

** 3 Vertical rails are required for the WDU 10, WDU 16 and WDU 35 terminals.

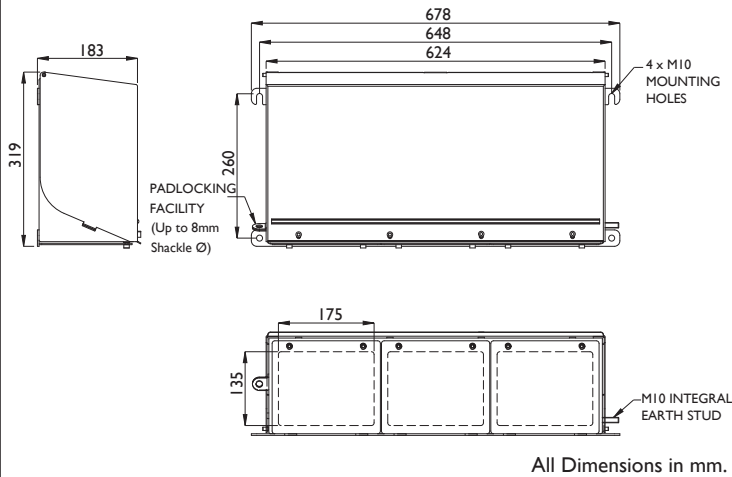
*** 2 Vertical rails are required for the WDU 35 terminals.

Notes:

- A combination of different sized entries is possible, please contact Hawke for more information.
- The table above gives an indication of potential terminal arrangements. Please contact Hawke for information on other arrangements or empty enclosures.
- A combination of different sized terminals is possible, please contact Hawke for more information.
- Other terminal types are available.

EZE-62 Increased Safety EExe**EZE-62**

Registered Design.®

**MAXIMUM QUANTITY OF ENTRIES**

Thread Size	M16	M20/Os/O	M20/A	M25	M32	M40	M50
Bottom Face Quantity	60	60	42 (36*)	27 (24*)	18	12	6

* Recommended maximum for cable gland installation.

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II. EZE-62 Baseefa Certificate No. Baseefa 04 ATEX 0171X.
- EZI-62 (Empty) Baseefa Certificate No. Baseefa 04 ATEX 0171U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- IP66 ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C. Temperature Class and Ambient T6 40°C. Optional T5 with ambients up to 65°C.

TERMINAL CAPACITY DATA

Terminal Type	Conductor Size (mm²)		Max. Volts	Typical Terminal Arrangements					
	Min.	Max.		5 Vertical Rails		2 Vertical Rails		1 Vertical Rail	
				Terminal Quantity	Amps	Terminal Quantity	Amps	Terminal Quantity	Amps
WDU 2.5	0.5	2.5	550	190	5	58	10	25	15
WDU 4	0.5	4	750	160	7	47	14	21	21
WDU 6	0.5	6	550	120	10	43	18	19	27
WDU 10	1.5	10	550	95	15	37	25	16	37
WDU 16	1.5	16	550	80	21	33(**)	33	15	49
WDU 35	2.5	35	750	60	36	27(**)	54	12	81

Information in the table above is based on the maximum conductor size permitted for the terminal.

** 3 Vertical rails are required for the WDU 16 and the WDU 35 terminals.

Notes:

- A combination of different sized entries is possible, please contact Hawke for more information.
- The table above gives an indication of potential terminal arrangements. Please contact Hawke for information on other arrangements or empty enclosures.
- A combination of different sized terminals is possible, please contact Hawke for more information.
- Other terminal types are available.

Technical Calculations

Technical Calculations





Dissipated Wattage Hawke Enclosures

Dissipated Wattage

ENCLOSURE DISSIPATED WATTAGE					
Enclosure Type	Temperature Class				
	T6 40°C & T5 55°C	T6 55°C	T5 40°C	T6 65°C	T5 65°C
PL612 GRP	4.1	2.5	5.6	1.5	3
PL615 GRP	6.4	4	8.8	2.4	4.8
PL620 GRP	11.4	7.1	15.6	4.2	8.5
PL630 GRP	20.8	13	28.6	7.8	15.6
PL712 GRP	3.352	2.148	4.6	1.2	2.4
PL722 GRP	5.318	3.323	7.3	1.9	3.9
SIZE 1 Stainless Steel	13.95	8.7	19.1	5.2	10.4
SIZE 2 Stainless Steel	18.15	11.3	24.9	6.8	13.6
SIZE 3 Stainless Steel	23.7	14.8	32.5	8.8	17.7
SIZE 4 Stainless Steel	29.95	18.7	41.1	11.2	22.4
SIZE 5 Stainless Steel	32.85	20.5	45.1	12.3	24.6
SIZE 6 Stainless Steel	40	25	55	15	30
SIZE 7 Stainless Steel	52	23.5	71.5	19.5	39
SIZE 8 Stainless Steel	65	40.6	89.3	24.3	48.7
SIZE 9 Stainless Steel	79.35	49.5	109.1	29.7	59.5

Dissipated Wattage Factor

The Dissipated Wattage Factor of the enclosures has been established by test to ensure that the maximum temperature as permitted by temperature certification is not exceeded.

When terminal quantities greater than those at maximum amps are required (up to maximum physical quantity only) then the current shall be reduced accordingly to remain within the Dissipated Wattage Factor of the enclosure.

Combined Terminal Resistance Factor (See page 39)

This factor is used to determine the number of terminals that can be accommodated within the enclosure without exceeding the Wattage Factor. The Combined Terminal Resistance Factor is the sum of the individual terminal resistances and the resistance of the cable core equal in length to the enclosure maximum diagonal.

(Core Resistance is taken from BS6360).

Wattage to be Dissipated = $N \times F \times I^2$

N = Number of Terminals. F = Combined Terminal Resistance Factor. I = Maximum Current.

e.g. Number of terminals in a PL630 enclosure at **20.8 Watts** : $10 \times \text{'WDU 2.5' (I=21A), } 2 \times \text{'WDU 6' (I=36A), } (10 \times 0.00290465 \times 21^2 = 12.9) + (2 \times 0.0012142 \times 36^2 = 3.2 \text{ Watts}).$

Total Watts = $12.9 + 3.2 = 16.1 \text{ Watts}.$

Therefore : This terminal combination is acceptable as the wattage is less than that of the PL630 maximum Watts
□ of 20.8W.

Note : If a smaller than maximum permitted conductor is fitted into a power terminal, then the smaller conductor resistance must be used when calculating the combined terminal resistance.

Transposed Formula :

$$W = N \times F \times I^2$$

$$N = \frac{W}{F \times I^2} \quad \square \quad \square \quad I = \sqrt{\frac{W}{N \times F}} \quad \square \quad \square \quad \square$$



Combined Terminal Resistance 'F' PL6, PL7 and Size I to 9 Enclosures

PL Series GRP Enclosures

COMBINED TERMINAL RESISTANCE 'F' (OHMS)						
Terminal	Enclosure Type					
	PL612	PL615	PL620	PL630	PL712	PL722
WDU 2.5N	0.00125107	0.00160675	0.00208840	0.00301465	0.00136222	0.00198466
WDU 2.5	0.00114107	0.00149675	0.00197840	0.00290465	0.00125222	0.00187466
WDU 4	0.00072547	0.00094675	0.00124640	0.00182265	0.00079462	0.00118186
WDU 6	0.00048116	0.00062900	0.00082920	0.00121420	0.00052736	0.00078608
WDU 10	0.00030741	0.00039525	0.00051420	0.00074295	0.00033486	0.00048858
WDU 16	-	0.00025125	0.00032600	0.00046975	-	-
WDU 35	-	-	0.00015376	0.00021926	-	-
WDU 70N	-	-	0.00011432	0.00014782	-	-

S Series Stainless Steel Enclosures

COMBINED TERMINAL RESISTANCE 'F' (OHMS)									
Terminal	Enclosure Type								
	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6	SIZE 7	SIZE 8	SIZE 9
WDU 2.5N	0.00258487	0.00345925	0.00412615	0.00460039	0.00521542	0.00617872	0.00731245	0.00838690	0.00948358
WDU 2.5	0.00247487	0.00334925	0.00401615	0.00449039	0.00510542	0.00606872	0.00720245	0.00827690	0.00937358
WDU 4	0.00155527	0.00209925	0.00251415	0.00280919	0.00319182	0.00379112	0.00449645	0.00516490	0.00584718
WDU 6	0.00103556	0.00139900	0.00167620	0.00187332	0.00212896	0.00252936	0.00300060	0.00344720	0.00390304
WDU 10	0.00063681	0.00085275	0.00101745	0.00113457	0.00128646	0.00152436	0.00180435	0.00206970	0.00234054
WDU 16	0.00040305	0.00053875	0.00064225	0.00071585	0.00081130	0.00096080	0.00113675	0.00130350	0.00147370
WDU 35	0.00018887	0.00025070	0.00029786	0.00033140	0.00037489	0.00044301	0.00052318	0.00059916	0.00067671
WDU 70N	-	0.00016390	0.00018802	0.00020517	0.00022742	0.00026226	0.00030326	0.00034212	0.00038178
WDU 70/95	-	0.00026270	0.00030986	0.00021517	0.00023742	0.00027226	0.00031326	0.00035212	0.00039178
WDU 70/95	-	-	-	0.00017175	0.00018777	0.00021286	0.00024239	0.00027037	0.00029893
WDU 120/150	-	-	-	0.00014859	0.00016129	0.00018118	0.00020459	0.00022677	0.00024941
WDU 120/150	-	-	-	0.00013180	0.00014209	0.00015821	0.00017718	0.00019516	0.00021351
WFF 35	-	-	-	0.00034340	0.00038689	0.00045501	0.00053518	0.00061116	0.00068871
WFF 70	-	-	-	0.00018517	0.00020742	0.00024226	0.00028326	0.00032212	0.00036178
WFF 120	-	-	-	0.00010859	0.00012129	0.00014118	0.00016459	0.00018677	0.00020941
WFF 185	-	-	-	-	-	0.00009849	0.00011365	0.00012802	0.00014269
WFF 300	-	-	-	-	-	0.00006760	0.00007679	0.00008551	0.00009440



Maximum Physical Quantity of Terminals Hawke Enclosures

W'Series and Direct Mounted Terminals in ATEX EExe Boxes

MAXIMUM PHYSICAL QUANTITY OF TERMINALS									
Terminal Type	Enclosure Type								
	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6	SIZE 7	SIZE 8	SIZE 9
WDU 2.5	30 (1 rail only)	60 (2 rails-30 per rail)	112 (2 rails-56 per rail)	168 (3 rails-56 per rail)	228 (3 rails-76 per rail)	380 (4 rails-95 per rail)	600 (5 rails-120 per rail)	852 (6 rails-142 per rail)	1155 (7 rails-165 per rail)
WDU 4	25 (1 rail only)	50 (2 rails-25 per rail)	94 (2 rails-47 per rail)	141 (3 rails-47 per rail)	192 (3 rails-64 per rail)	320 (4 rails-80 per rail)	550 (5 rails-110 per rail)	720 (6 rails-120 per rail)	980 (7 rails-140 per rail)
WDU 6	19 (1 rail only)	42 (2 rails-21 per rail)	72 (2 rails-36 per rail)	108 (3 rails-36 per rail)	144 (3 rails-48 per rail)	240 (4 rails-60 per rail)	380 (5 rails-76 per rail)	540 (6 rails-90 per rail)	735 (7 rails-105 per rail)
WDU 10	15 (1 rail only)	36 (2 rails-18 per rail)	56 (2 rails-28 per rail)	84 (3 rails-28 per rail)	120 (3 rails-40 per rail)	200 (4 rails-50 per rail)	300 (5 rails-60 per rail)	438 (6 rails-73 per rail)	595 (7 rails-85 per rail)
WDU 16	13 (1 rail only)	28 (2 rails-14 per rail)	48 (2 rails-24 per rail)	72 (3 rails-24 per rail)	96 (3 rails-32 per rail)	160 (4 rails-40 per rail)	250 (5 rails-50 per rail)	360 (6 rails-60 per rail)	490 (7 rails-70 per rail)
WDU 35	9 (1 rail only)	20 (2 rails-10 per rail)	36 (2 rails-18 per rail)	54 (3 rails-18 per rail)	72 (3 rails-24 per rail)	120 (4 rails-30 per rail)	190 (5 rails-38 per rail)	270 (6 rails-45 per rail)	371 (7 rails-43 per rail)
WDU 70N	N/A	8 (1 rail only)	14 (1 rail only)	30 (2 rails-15 per rail)	40 (2 rails-20 per rail)	50 (2 rails-25 per rail)	93 (3 rails-31 per rail)	108 (3 rails-36 per rail)	172 (4 rails-43 per rail)
WDU 70/95	N/A	N/A	N/A	15 (1 rail only)	15 (1 rail only) (Reduce by 1 for rail earth)	19 (1 rail only) (Reduce by 1 for rail earth)	23 (1 rail only) (Reduce by 1 for rail earth)	56 (2 rails-28 per rail) (Reduce by 1 for rail earth)	64 (2 rails-32 per rail) (Reduce by 1 for rail earth)
WDU 120/150	N/A	N/A	N/A	9 (1 rail only) (Reduce by 1 for rail earth)	12 (1 rail only) (Reduce by 1 for rail earth)	16 (1 rail only) (Reduce by 1 for rail earth)	20 (1 rail only) (Reduce by 1 for rail earth)	46 (2 rails-23 per rail) (Reduce by 1 for rail earth)	54 (2 rails-27 per rail) (Reduce by 1 for rail earth)
WFF 35	N/A	6 (1 rail only)	11 (1 rail only)	11 (1 rail only) (Reduce by 1 for rail earth)	15 (1 rail only) (Reduce by 1 for rail earth)	38 (2 rails-19 per rail) (Reduce by 1 for rail earth)	46 (2 rails-23 per rail) (Reduce by 1 for rail earth)	84 (3 rails-28 per rail) (Reduce by 1 for rail earth)	96 (3 rails-32 per rail) (Reduce by 1 for rail earth)
WFF 70	N/A	N/A	N/A	9 (1 rail only) (Reduce by 1 for rail earth)	12 (1 rail only) (Reduce by 1 for rail earth)	16 (1 rail only) (Reduce by 1 for rail earth)	40 (2 rails-20 per rail) (Reduce by 1 for rail earth)	46 (2 rails-23 per rail) (Reduce by 1 for rail earth)	81 (3 rails-27 per rail) (Reduce by 1 for rail earth)
WFF 120	N/A	N/A	N/A	7 (1 rail only) (Reduce by 1 for rail earth)	9 (1 rail only) (Reduce by 1 for rail earth)	12 (1 rail only) (Reduce by 1 for rail earth)	15 (1 rail only) (Reduce by 1 for rail earth)	36 (2 rails-18 per rail) (Reduce by 1 for rail earth)	42 (2 rails-21 per rail) (Reduce by 1 for rail earth)
WFF 185	N/A	N/A	N/A	N/A	N/A	9 (1 rail only) (Reduce by 1 for rail earth)	11 (1 rail only) (Reduce by 1 for rail earth)	13 (1 rail only) (Reduce by 1 for rail earth)	32 (2 rails-16 per rail) (Reduce by 1 for rail earth)
WFF 300	N/A	N/A	N/A	N/A	N/A	9 (1 rail only) (Reduce by 1 for rail earth)	11 (1 rail only) (Reduce by 1 for rail earth)	13 (1 rail only) (Reduce by 1 for rail earth)	32 (2 rails-16 per rail) (Reduce by 1 for rail earth)

Notes:

Earths : ☐ Size 1 to 9 :When rail earths are required, the power terminals shall be reduced accordingly.

☐ Size 1 to 9 : Internal/external earth stud is suitable for conductors up to 80mm². For larger conductors, contact Hawke International.

Rails : ☐ Size 1 to 9 : If 'WFF' terminals are required with 'TW' partitions, then the box size and/or rail quantity may change due to the large width of these partitions.

Box Size : ☐ Size 1 to 9 : 'WFF' series terminals shall be fitted in 210 deep enclosures.

WDU 70N, WDU 70/95, WDU 120/150 and all WFF series terminals are fitted on 'heavy duty' rail.



Maximum Physical Quantity of Terminals and Table of Earths Hawke Enclosures

W'Series and Direct Mounted Terminals in ATEX EExe Boxes

MAXIMUM PHYSICAL QUANTITY OF TERMINALS							
Terminal Type	Enclosure Type						
	PL612	PL615	PL620	PL630		PL712	PL722
				1 Diagonal Rail	2 Vertical Rails		
WDU 2.5N	12 + 1 Earth (1 central or offset entry only)	N/A	N/A	N/A	N/A	12 + 1 Earth (1 central entry only)	N/A
WDU 2.5	10 + 1 Earth (1 offset entry only)	14 + 1 Earth	24 + 1 Earth	50 + 1 Earth	76 + 2 Earths (38 + 1 earth per rail)	10 + 1 Earth (1 central entry only)	35 + 1 Earth (No entries on faces B & D)
WDU 4	10 + 1 Earth (1 offset entry only)	12 + 1 Earth	20 + 1 Earth	42 + 1 Earth	64 + 2 Earths (32 + 1 earth per rail)	10 + 1 Earth (1 central entry only)	29 + 1 Earth (No entries on faces B & D)
WDU 6	7 + 1 Earth (1 offset entry only)	9 + 1 Earth	15 + 1 Earth	30 + 1 Earth	48 + 2 Earths (24 + 1 earth per rail)	7 + 1 Earth (1 central entry only)	22 + 1 Earth (No entries on faces B & D)
WDU 10	6 + 1 Earth (1 offset entry only)	7 + 1 Earth	12 + 1 Earth	25 + 1 Earth	36 + 2 Earths (18 + 1 earth per rail)	6 + 1 Earth (1 central entry only)	17 + 1 Earth (No entries on faces B & D)
WDU 16	N/A	6 + 1 Earth (1 offset entry only)	9 + 1 Earth	20 + 1 Earth	30 + 2 Earths (15 + 1 earth per rail)	N/A	N/A
WDU 35	N/A	N/A	6 + 1 Earth	15 + 1 Earth	22 + 2 Earths (11 + 1 earth per rail)	N/A	N/A
WDU 70N	N/A	N/A	4 + 1 Earth	11 + 1 Earth (Conductor termination difficult - Advise 9 + 1 Earth)	N/A	N/A	N/A
BK6	1	N/A	N/A	N/A	N/A	1	N/A
MK6/6	1	N/A	N/A	N/A	N/A	1	N/A
HTB/6	1	1	2	N/A	N/A	1	N/A

Notes:

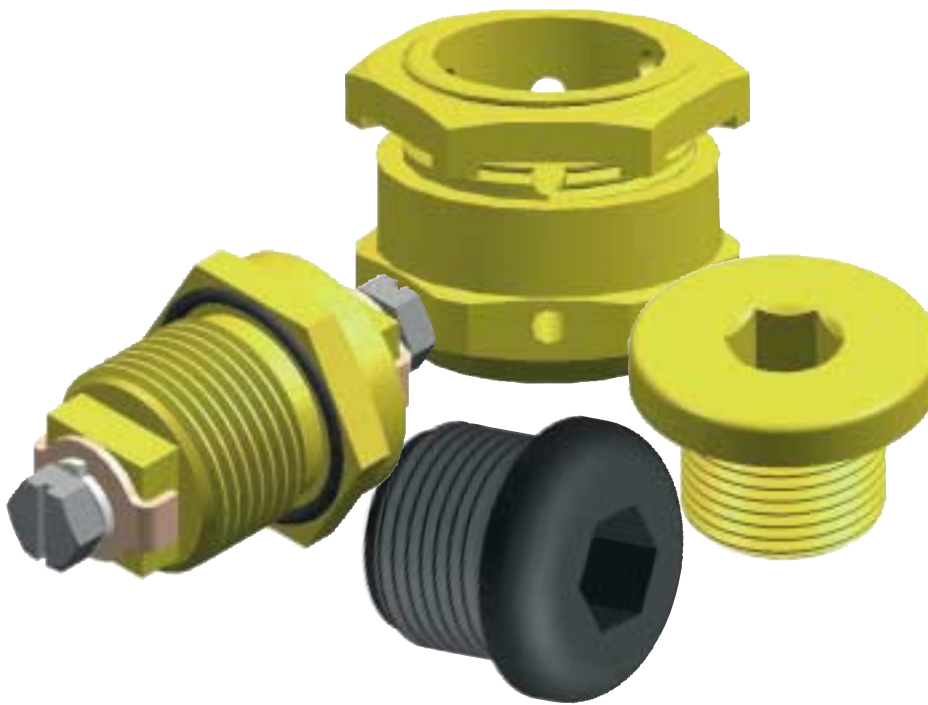
- Earths : ☐ PL612 and PL712 : The rail earths may be replaced by a pillar earth, but a bracket shall be fitted at the end of the terminal stack in it's place. Pillar earths will inhibit offset entries.
- Entries : ☐ PL612, PL615, PL712 and PL722 : Where the quantity of entries has been restricted, this is due to limited space. If multiple entries are required, then the quantity of power terminals shall be reduced accordingly.
- ☐ PL712 : It may be possible for some maximum terminal assemblies to use two M20/O entry positions from the 3 position options i.e. Faces A & C = D1 & A6. Faces B & D = D1 & A7.
- Rails : ☐ PL612, PL615, PL620 and PL712 : 1 Diagonal rail.
- ☐ PL722 : 1 Horizontal rail.

TABLE OF EARTHS					
Manufacturer	Earth Terminal	Conductor Size (mm ²)		Power Terminal	Power Terminal
		Min.	Max.		
Weidmuller	WPE 2.5N	0.5	2.5	WDU 2.5N	Rail Mounted
Weidmuller	WPE 2.5	0.5	2.5	WDU 2.5N & WDU 2.5	Rail Mounted
Weidmuller	WPE 4	0.5	4	WDU 2.5 & WDU 4	Rail Mounted
Weidmuller	WPE 6	0.5	6	WDU 6	Rail Mounted
Weidmuller	WPE 10	1.5	10	WDU 10	Rail Mounted
Weidmuller	WPE 16	1.5	16	WDU 16	Rail Mounted
Weidmuller	WPE 35	2.5	35	WDU 35 & WFF 35	Rail Mounted
Weidmuller	WPE 70N	10	70	WDU 70N & WFF 70	Rail Mounted
Weidmuller	WPE 70/95	16	95	WDU 70/95	Rail Mounted
Weidmuller	WPE 120/150	35	120	WDU 120/150 & WFF 120	Rail Mounted
Hawke	PET5 (Pillar Earth)	0.5	10	WDU 2.5N to WDU 10, HTB6, MK6/6 & BK6	Direct Mounted
Hawke	IES10 (Internal/External Earth Stud)	0.5	16	For Enclosures with Power Terminals up to 16mm ² Max. only	M20/A Gland Entry Position
WeCo	DFG/2 (Pillar Earth)	0.5	6 Solid 4 Stranded	For PL612 without an Earth Continuity Plate	Direct Mounted

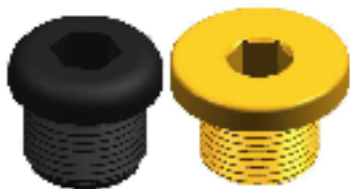
Notes:

The junction box shall be fitted with an internal earth terminal/stud that is capable of accepting a conductor equal to that of the largest power terminal. The IES10 internal/external earth stud shall NOT foul on any components inside the box.

Accessories



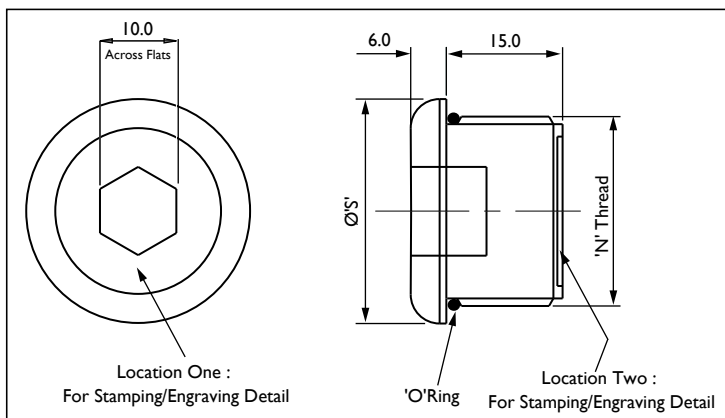
Accessories



Accessories

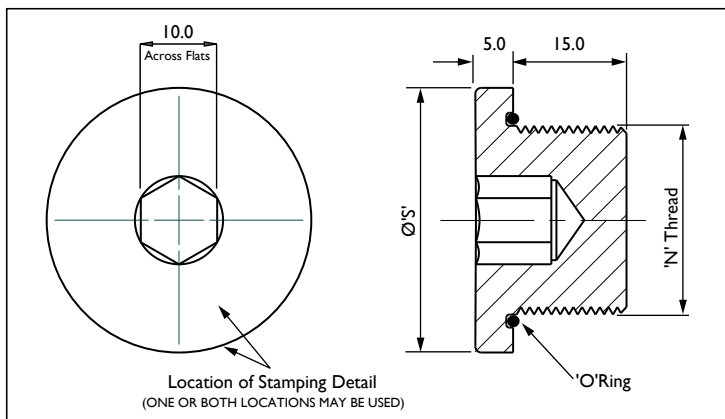
Stopping Plug Types 375 and 387

Increased Safety EExe



APPLICATION DATA		
'N' Thread Size	Ø 'S'	Key Size (Across Flats)
M20	25	10
M25	30	10

All Dimensions in millimetres.



APPLICATION DATA		
'N' Thread Size	Ø 'S'	Key Size (Across Flats)
M16	25.4	10
M20	30	10
M25	35	10
M32	42	10
M40	54	10
M50	63.5	10
M63	76.2	10
M75	89	10

All Dimensions in millimetres.

Note : The PL6 series, PL7 series and Size 1 to 9 ATEX enclosures can **only** be fitted with the above ATEX approved Stopping Plugs.

Hawke 375

Plastic Stopping Plug

Technical Data

- Increased Safety EExe. II 2 GD EExe II.
- 375 Plug BASEEFA Certificate No. BAS 01 ATEX 2104U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- Meets IP66 and IP67 ingress protection to IEC 60529 and EN 60529 in PL6 series enclosures.
- Meets IP66 ingress protection to IEC 60529 in PL7 series and S series enclosures.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -20°C to +75°C.
- Suitable for T6 and T5 applications.

Hawke 387

Brass Stopping Plug

Technical Data

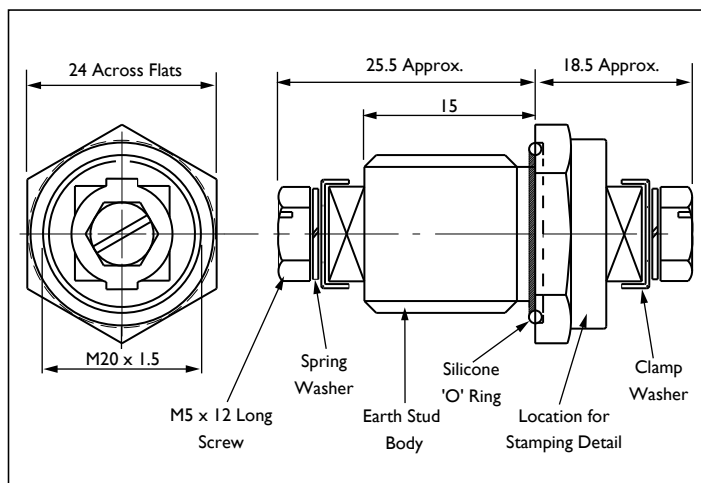
- Increased Safety EExe. II 2 GD EExe II.
 - 387 Plug BASEEFA Certificate No. BAS 01 ATEX 2112U.
 - Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
 - Construction and test standards EN 50014, EN50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
 - Meets IP66 and IP67 ingress protection to IEC 60529 and EN 60529 in PL6 series enclosures.
 - Meets IP66 ingress protection to IEC 60529 in PL7 series and S series enclosures.
 - DTS01 deluge protection witnessed by EECS.
 - Operating temperature range -60°C to +200°C.
 - Suitable for T6 and T5 applications.
- (Alternative 387 materials and parallel thread options may be available. Contact Hawke Sales).



Accessories

Internal/External Earth Stud HTB6/PET5 and Breather Drain

Increased Safety EExe

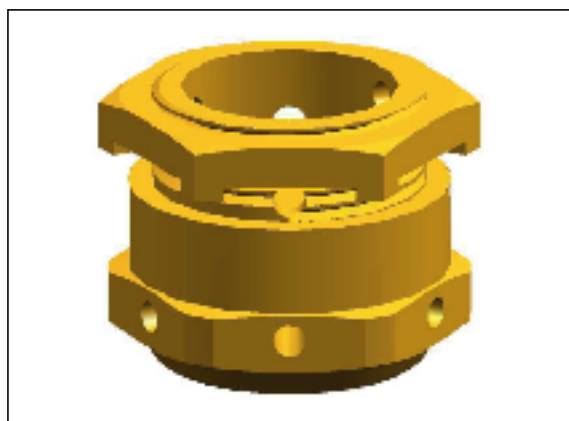


Hawke ATEX IES10 Internal/External Earth Stud

Technical Data

- Increased Safety EExe. Ex II 2 GD EExe II.
- IES10 Internal/External Earth Stud BASEEFA Certificate No. BAS 01 ATEX 2111U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- Meets IP66 and IP67 ingress protection to IEC 60529 and EN 60529 in PL6 series enclosures.
- Meets IP66 ingress protection to IEC 60529 and EN 60529 in PL7 series and S series enclosures.
- Operating temperature range -60°C to $+200^{\circ}\text{C}$.
- Suitable for T6 and T5 applications.
- Suitable for conductors up to 16mm^2 .

Accessories



Breather/Draining Device

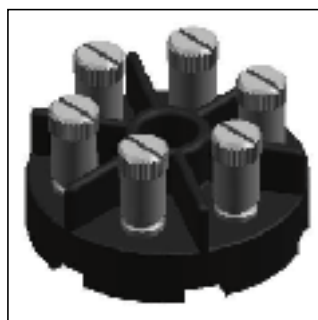
Technical Data

- Fits M20 or M25 entry positions. (M20 as standard).
- ATEX component approved and listed on Hawke ATEX EExe enclosures.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Meets IP66 ingress protection to IEC 60529 and EN 60529.
- Operating temperature range -50°C to $+85^{\circ}\text{C}$.

Note : The PL6 series enclosures are marked on the rating label 'IP66' and 'IP67' and -60°C to $+40^{\circ}\text{C}$ as standard. When a Breather/Drain is fitted, the rating label **shall** be amended to read '**IP66**' and -50°C to $+40^{\circ}\text{C}$.

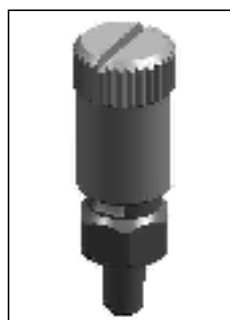
Approved Components Available from Hawke

Hawke HTB6



Terminal Block Type : HTB6
BASEEFA Certificate No.
BAS 01 ATEX 2275U.

Hawke PET5



Pillar Earth Terminal Type : PET5
BASEEFA Certificate No.
BAS 01 ATEX 2274U.

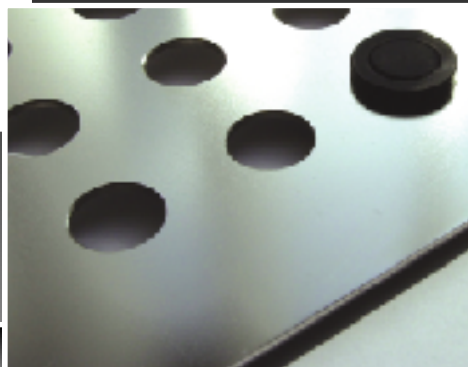
New Push-in Stopping Plug



ExPress



**No Locknut
Required**



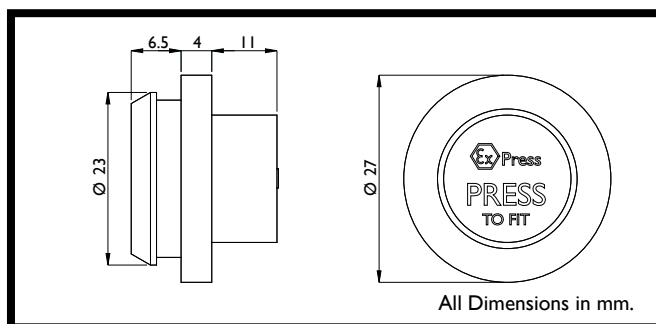
Extra-Fast

Push-in Stopping Plug

ExPress Increased Safety EExe

APPLICATION DATA

Clearance Hole	Gland Plate Thickness	Min/Max Clearance Hole Ø
M20	2mm - 3mm	20mm - 20.7mm



Technical Data

- Increased Safety EExe. **Ex** II 2 GD EExe II.
- **Ex**Press Plug Baseefa Certificate No. Baseefa 04 ATEX 0168U.
- Suitable for use in Zone 1, Zone 2, Zone 21 & Zone 22.
- Construction and test standards EN 50014, EN 50019 and EN 50281-1-1. IEC 60079-0 and IEC 60079-7.
- Meets IP66 ingress protection for S Series and EZE Series Enclosures.
- DTS01 deluge protection witnessed by EECS.
- Operating temperature range -40°C to +80°C.



Cast Iron Series Enclosures

Cast Iron Enclosures available from Hawke International

CBS Cast Iron Enclosure



- Flameproof EExd. Ex IIC.
- CBS BASEEFA Certificate No. Ex 821232.
- ZCBS BASEEFA Certificate No. Ex 811143U.
- Suitable for use in Zone 1 & Zone 2.
- Construction and test standards EN 50014 and EN 50018.
- IP66 ingress protection.
- Temperature Class and Ambients T6 40°C.

XB Cast Iron Enclosure



- Flameproof EExd. Ex IIB.
- XB BASEEFA Certificate No. Ex 811001.
- ZXB BASEEFA Certificate No. Ex 811173U.
- Suitable for use in Zone 1 & Zone 2.
- Construction and test standards EN 50014 and EN 50018.
- IP66 ingress protection.
- Temperature Class and Ambients T6 40°C.
- T5 55°C option available.

3B Cast Iron Enclosure



- Flameproof EExd. Ex IIB.
- 3B BASEEFA Certificate No. Ex 821357.
- Z3B BASEEFA Certificate No. Ex 821193U.
- Suitable for use in Zone 1 & Zone 2.
- Construction and test standards EN 50014 and EN 50018.
- IP65 ingress protection.
- Temperature Class and Ambients T6 40°C.
- T5 55°C option available.

For more detailed information/data sheets on the above enclosures, please contact Hawke International.
Visit our website at:- www.ehawke.com

Technical Data

Technical Data





Technical Data

Hawke Enclosures

The intent of this section of the catalogue is to identify important features that may be useful in the selection and installation of explosion protected electrical equipment.

There are numerous different regulations, codes, guidelines and standards for the design, installation and maintenance of electrical and non-electrical systems for use in potentially explosive atmospheres. The type of operational facility, geographic location, operator practice, local and national legislation, authority having jurisdiction etc. will determine many of the design and installation rules permitted. A fixed or floating petroleum facility located offshore, for example, would not be designed or classified in the same manner as an onshore petrochemical facility.

1.0 □ Potentially Explosive Atmospheres

An explosive atmosphere is defined as a mixture: -

- Of flammable substances in the form of gases, vapours, mists, dusts or fibres
- With air
- Under atmospheric conditions
- In which, after ignition has occurred, combustion spreads to the entire unburned mixture

2.0 □ Area Classification (Classification of Locations)

The purpose of area classification is to provide a basis for the correct selection, installation and location of electrical and non-electrical equipment in those areas. Areas must be classified depending on the properties of the flammable vapours, liquids, gases, mists, combustible dusts or fibres that may be present and the likelihood that a flammable or combustible concentration or quantity is present.

The aim of area classification is to avoid ignition of flammable releases that may occur in the operation of facilities. The intent is to reduce to an acceptable minimum level the probability of a flammable atmosphere and an ignition source occurring at the same time.

3.0 □ CENELEC and IEC

3.1 □ Area Classification

Area classification is the division of a facility into three-dimensional hazardous areas and non-hazardous areas and the sub-division of the hazardous area into 'Zones'.

Hazardous areas may be sub-divided into three Zones as follows: -

Flammable gases and vapours	
Zone 0	An area in which an explosive atmosphere is constantly present, or present for long periods.
Zone 1	An area in which an explosive atmosphere is likely to occur in normal operation. (Rough Guide: 10 hours or more / year but less than 1,000 hours / year)
Zone 2	An area in which an explosive atmosphere is not likely to occur in normal operation and if it occurs, it will exist only for a short time. (Rough Guide: Less than 10 hours / year)



Combustible Dusts

Zone 20	An area in which combustible dust, as a cloud, is present continuously or frequently, during normal operation, in sufficient quantity to be capable of producing an explosive concentration of combustible dust in a mixture with air
Zone 21	An area, in which combustible dust, as a cloud, is occasionally present during normal operation, in a sufficient quantity to be capable of producing an explosive concentration of combustible dust in a mixture with air.
Zone 22	An area, in which combustible dust, as a cloud, may occur infrequently and persist for only a short period, or in which accumulations of layers of combustible dust may give rise to an explosive concentration of combustible dust in mixture with air.

For further information on the classification of hazardous areas, see: -

- IEC 60079-10** ■ Electrical Apparatus for Explosive Gas Atmospheres, Classification of Hazardous Areas
- IEC 61241-3** ■ Electrical apparatus for use in the presence of combustible dust
(Proposed Change to IEC 61241-10) Part 3: Classification of areas where combustible dusts are, or may be, present
- IEC 60079-10** ■ Electrical Apparatus for Explosive Gas Atmospheres, Classification
- PR EN 50281-3** ■ Classification of areas where dusts are, or may be, present
- Institute of Petroleum** ■ Model Code of Safe Practice in the Petroleum Industry, Part 15: Area Classification Code for Petroleum Installations, IP 15

3.2 □ Classification Society

A Classification Society may also enforce requirements for the design and installation of facilities. These requirements, which are in addition to statutory requirements, may influence the design and installation of the electrical systems. Classification Societies include ABS, DNV and Lloyds Register.

3.3 □ Design and Installation of Electrical Systems for Hazardous (Classified) Areas

There are numerous regulation codes, guidelines and standards for the design, selection and installation of electrical installation in potentially explosive atmospheres. These requirements are in addition to the requirements for installations in non-hazardous areas.

There are several types of protection, i.e. construction techniques, available for electrical apparatus in hazardous areas. The type of protection permitted will depend upon the applicable installation codes and rules to be adopted.

The selection of electrical apparatus should be in accordance with the following: -

- Classification of the hazardous area
- Temperature class or ignition temperature of the gas, liquid, vapours, mist, dust or fibre
- Where applicable, the gas, vapour or dust classification in relation to the group or sub-group of the electrical apparatus
- External influences and ambient temperature



Technical Data

Hawke Enclosures

3.4 Apparatus selection according to Zones

Apparatus for use in Zone 0

- Intrinsic safety 'ia'

Apparatus for use in Zone 1

- Electrical apparatus permitted for use in Zone 0.
- Flameproof enclosure 'd'
- Pressurised apparatus 'p'
- Powder filling 'q'
- Oil immersion 'o'
- Increased safety 'e'
- Intrinsic safety 'ib'
- Encapsulation 'm'

Apparatus for use in Zone 2

- Electrical apparatus permitted for use in Zone 0 or Zone 1 or
- Electrical apparatus designed specifically for Zone 2 (for example type of protection 'n' or
- Electrical apparatus complying with the requirements of a recognised standard for industrial electrical apparatus, which does not, in normal operation, have ignition - capable hot surface and does not in normal operation produce arcs or sparks. This equipment must be in an enclosure with a degree of protection and mechanical strength suitable for the environment and be assessed by a person who is familiar with the requirements of any relevant standards and codes of practice.

Apparatus for use in Zones 20, 21 and 22

- Refer to EN 50281-1-2 Electrical apparatus protected by enclosures - Selection, installation and maintenance.

3.5 Apparatus selection according to the ignition temperature of the gas or vapour

The equipment must be selected so that its maximum surface temperature will not reach the ignition temperature of any gas or vapour that may be present.

Temperature class of electrical apparatus	Maximum surface temperature of electrical apparatus	Ignition temperature of gas or vapour
T1	450°C	>450°C
T2	300°C	>300°C
T3	200°C	>200°C
T4	135°C	>135°C
T5	100°C	>100°C
T6	85°C	>85°C

If the marking of the electrical apparatus does not include an ambient temperature range, the apparatus is only for use within an ambient temperature range from -20°C to +40°C.

For further information regarding data for flammable gases and vapours, see PD IEC 60079-20.



Technical Data

Hawke Enclosures

3.6 Apparatus selection according to apparatus grouping

The grouping of gases and vapours are classified into Group I and Group II categories. Group I is relevant to atmospheres containing firedamp (a mixture of gases, composed mostly of methane, found underground in mines).

Group II is intended for use in all other places with potentially explosive atmospheres. Group II electrical apparatus with types of protection 'd' and 'i' are further sub-divided into apparatus group IIA, IIB or IIC. Electrical apparatus with type of protection 'n' may also be sub-divided if it contains certain devices or components.

Gas / Vapour Sub-division	Apparatus sub-group permitted
IIA (typical gas propane)	IIA, IIB or IIC
IIB (typical gas ethylene)	IIB or IIC
IIC (typical gases acetylene and hydrogen)	IIC

3.7 Apparatus Construction Standards

CENELEC	IEC
EN 50014□-□ General Requirements	IEC 60079-0□-□ General Requirements
EN 50015□-□ Oil Immersion 'o'	IEC 60079-6□-□ Oil Immersion 'o'
EN 50016□-□ Pressurisation 'p'	IEC 60079-2□-□ Pressurisation 'p'
EN 50017□-□ Powder Filling 'q'	IEC 60079-5□-□ Powder Filling 'q'
EN 50018□-□ Flameproof Enclosure 'd'	IEC 60079-1□-□ Flameproof Enclosure 'd'
EN 50019□-□ Increased Safety 'e'	IEC 60079-7□-□ Increased Safety 'e'
EN 50020□-□ Intrinsic Safety 'i'	IEC 60079-11□-□ Intrinsic Safety 'i'
EN 50021□-□ Electrical Apparatus type 'n'	IEC 60079-15□-□ Electrical Apparatus type 'n'
EN 50028□-□ Encapsulation 'm'	IEC 60079-18□-□ Encapsulation 'm'

3.8 Installation Standards and Codes

There are numerous different regulations, codes, guidelines and standards for the design, installation and maintenance of electrical and non-electrical systems for use in potentially explosive atmospheres. The type of operational facility, geographic location, operator practice, local and national legislation, authority having jurisdiction etc. will determine many of the design and installation rules permitted.

For further information on the design, selection and installation of equipment for use in hazardous areas see: -

- IEC 60079-14** ■ Electrical installations in hazardous areas (other than mines)
- IEC 61892-7** ■ Mobile and fixed offshore units - Electrical installation, Part 7: Hazardous areas
- IEC 612141-1-2** ■ Electrical apparatus in the presence of combustible dust.
- (Proposed Change to IEC 612141-14)** Part 1-2: Electrical apparatus protected by enclosures and surface temperature
- EN 60079-14** ■ Electrical installations in hazardous areas (other than mines)
- EN 50281-1-2** ■ Electrical apparatus for use in the presence of combustible dust
- Part 1 - 2. Electrical apparatus protected by enclosures - selection, installation and maintenance.



Technical Data Hawke Enclosures

3.9 Inspection Standards and Codes

For information regarding the installation and maintenance of equipment for use in hazardous see: -

IEC 60079-17

- Inspection and maintenance of electrical installations in hazardous areas (other than mines)

IEC 61241-17

- Electrical apparatus for use in the presence of combustible dust atmosphere - Part 17: Inspection and maintenance

4.0 ATEX 94/9/EC Directive

ATEX is the term used when referring to the European Unions (EU) Directive 94/9/EC

The ATEX Directive main objectives are to guarantee the free circulation of goods within the European Union by aligning the technical and legal requirements of the Member States.

"ATEX" is derived from the French "Atmosphères Explosibles".

The Directive is named: - "Approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres".

The Directive covers electrical and non-electrical equipment and protective systems intended for use in potentially explosive atmospheres in mining and surface industries.

The Directive covers: -

- equipment and products that have potential ignition sources
- protective systems - products that control the effects of incipient explosions
- safety devices - products that may be outside a potentially explosive atmosphere but that have an explosion safety function.
- components - products that are intended to form parts of equipment or protective systems

To ensure compliance with the Directive, equipment must meet with the essential requirements specified in the Directive and be marked with the CE marking.

The process of ensuring that equipment complies with the Directive, conformity assessment procedure(s) must be complied with. These procedures may involve a Notified Body. A Notified body is a body that is independent of the product manufacturer and assesses conformity of the products and the manufacturer with the Directive. The Notified Body has to be approved and appointed by its government.

Conformity assessment procedures include, but are not limited by: -

- EC Type examination - including testing and inspection of a product design, where appropriate
- Production Quality Assurance - including the assessment, periodic auditing, testing and inspection of production samples, where appropriate, and of the manufacturers quality system.
- Product Verification - the inspection and/or testing of each production item for conformity with the type that was subjected to EC Type Examination
- Internal Control of Production - the verification by the manufacturer that the product design and each production item conform to either harmonised European Standards or the essential requirements or a combination of the two

The ATEX Directive came into force on a voluntary basis on 1st March 1996 and will become mandatory from the 1st July 2003 and all products within its scope will have to comply before being placed on the market or put into service.



Technical Data Hawke Enclosures

The Directive classifies equipment into eight categories depending on the equipment's area of use: -

- Category M1 ▪ equipment intended for mining use and is required to remain functional in the presence of an explosive atmosphere.
- Category M2 ▪ equipment intended for mining use but is intended to be de-energised in the event of an explosive atmosphere.
- Category 1G ▪ non-mining equipment for use in Zone 0.
- Category 2G ▪ non-mining equipment for use in Zone 1.
- Category 3G ▪ non-mining equipment for use in Zone 2.
- Category 1D ▪ non-mining equipment for use in Zone 20.
- Category 2D ▪ non-mining equipment for use in Zone 21.
- Category 2D ▪ non-mining equipment for use in Zone 22.

4.1 □ ATEX 137 Directive 99/92/EC

The Directive covers the use of equipment in potentially explosive atmospheres and its aim is to establish minimum requirements for improving the safety and health of workers.

Article 137 of Directive 89/391/EC was published in the official journal of the EC on 28th January 2000 as Directive 99/92/EC, it is the 15th individual Directive of the framework Directive 89/391/EEC.

The article defines the: -

- Obligations of the employees re. the prevention and protection against explosions
- Assessment obligations re. the assessment of explosion risks.
- General obligations re. the safety and health of worker
- Requirements for explosion protection documents

In places where potentially explosive atmospheres may occur in such quantities as to endanger the health and safety of workers, the point of entry must be marked with the sign shown below in accordance with Section II, Article 7 of the Directive.





5.0 ☐ Extract from EN 60079-14 : 1997 / IEC 60079-14 : 1996 ☐ Installations in hazardous areas

9.1.3 ☐ Connections

The connection of cables and conduits to the electrical apparatus shall be made in accordance with the requirements of the relevant type of protection.

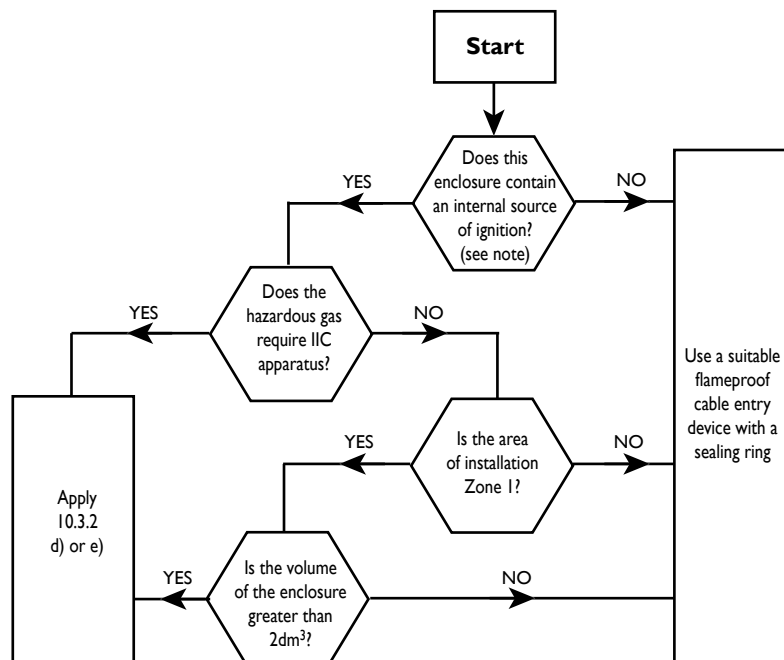
Notes:

1 ☐ Certain types of cable employ materials which can exhibit significant "cold flow" characteristics which could have adverse effects on the protection of the apparatus. Where such cable is to be used, a suitable cable entry device should be employed, for example cable entry devices not employing compression seals which act upon the part(s) of the cable having "cold flow" characteristics.

2 ☐ "Cold flow" can be more fully described as "thermoplastic materials which flow when subjected to pressure of ambient temperature".

Figure 1 - Selection chart for cable entry devices into flameproof enclosures for cables complying with item b) of 10.3.2

It is important to read notes and 10.3.2 before selecting appropriate cable gland for flameproof applications from Figure 1 below



NOTE - Internal sources of ignition include sparks or equipment temperatures occurring in normal operation which can cause ignition. An enclosure containing terminals only or an indirect entry enclosure (see 10.3.1) is considered not to constitute an internal source of ignition.



Hazardous Area Information

10.3 Cable Entry Systems

10.3.1 General

It is essential that cable entry systems comply with all the requirements referred to in the appropriate apparatus standard, that the cable entry device is appropriate to the type of cable employed, maintains the respective method of protection and is in accordance with clause 9.

Where cables enter into flameproof apparatus via flameproof bushings through the wall of the enclosure which are part of the apparatus (indirect entry), the parts of the bushings outside the flameproof enclosure will be protected in accordance with one of the types of protection listed in IEC 79-0. Normally the exposed part of the bushings will be within a terminal compartment which will either be another flameproof enclosure or will be protected by protection type 'e'. Where the terminal compartment is Ex'd', then the cable system shall comply with 10.3.2. Where the terminal compartment is Ex'e', then the cable system shall comply with 11.3.

Where cables enter into flameproof apparatus directly, the cable system shall comply with 10.3.2.

10.3.2 Selection

The cable entry system shall comply with one of the following:

- a) cable entry device in compliance with IEC 79-1 and the particular type of cable intended for use with that device.
- b) thermoplastic, thermosetting or elastomeric cable which is substantially compact and circular, has extruded bedding and the fillers, if any, are non-hygroscopic, may utilize flameproof cable entry devices, incorporating a sealing ring selected in accordance with figure 1;
- c) mineral insulated cable with or without plastic outer covering with appropriate flameproof cable entry device;
- d) flameproof sealing device (for example a stopper box or sealing chamber) specified in the apparatus documentation or having component approval and employing cable entry devices appropriate to the cables used. The sealing devices such as stopper boxes or sealing chambers shall incorporate compound or other appropriate seals which permit stopping around individual cores. Sealing devices shall be fitted at the point of entry of cables to the apparatus;
- e) flameproof cable entry devices incorporating compound filled seals around the individual cores or other equivalent sealing arrangements;
- f) other means which maintain the integrity of the flameproof enclosure.

NOTE - Where a factory-made termination of the encapsulated type is used, no attempt should be made to interfere with the connection to the apparatus or to replace the cable.



Hazardous Area Information

11.3 ☐ Wiring Systems

11.3.1 ☐ General

Cables and conduits shall be installed in accordance with clause 9 and the following additional requirements concerning cable entries and conductor terminations.

11.3.2 ☐ Cable Entry Devices

The connection of cables to increased safety apparatus shall be effected by means of cable entry devices appropriate to the type of cable used. They shall maintain protection type 'e' and shall incorporate a suitable sealing component to achieve IP54 degree of protection of the terminal enclosure.

NOTES

1 ☐ To meet IP 54 it may be necessary to seal between the cable and the enclosure (for example by means of a sealing washer or thread sealant).

2 ☐ Threaded cable entry devices into threaded cable entry plates or enclosures of 6mm or greater thickness need no additional sealing between the cable entry device and the entry plate or enclosure providing the axis of the cable entry device is perpendicular to the external surface of the cable entry plate or enclosure.

ACKNOWLEDGEMENT

Extracts from BS EN 60079-14 : 1997 reproduced with the permission of BSI under licence no. PD/1998 1818 and 1920. Complete editions of the standards can be obtained by post from BSI Customer Services, 389 Chiswick High Road, London. W4 4AL



Technical Data Hawke Enclosures

6.0 Apparatus Marking - IEC and CENELEC (Group II)

6.1 ATEX Marking (Enclosures)

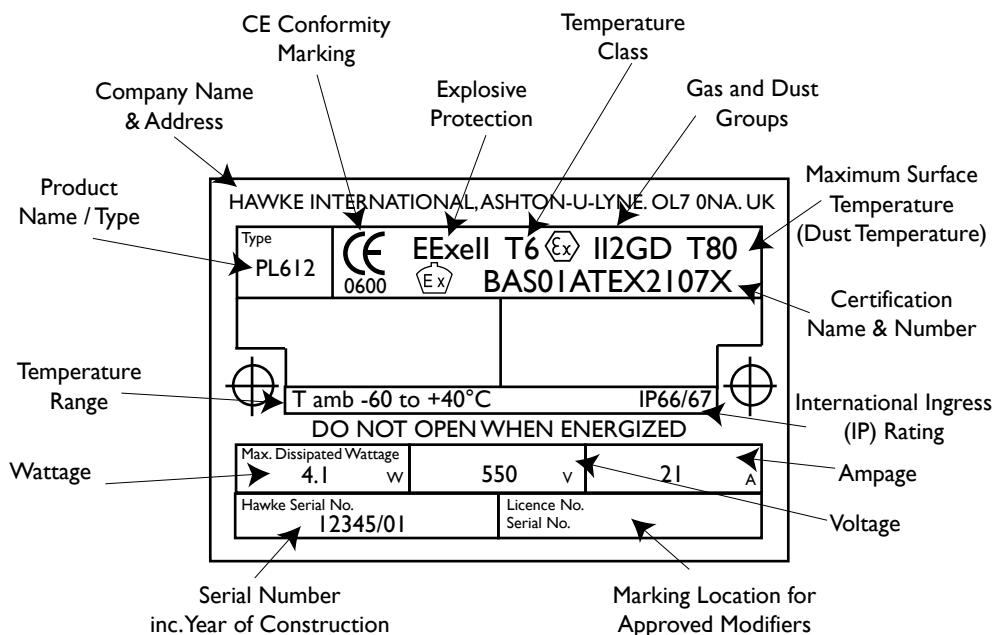
- The name and address of the manufacturer
- Type, serial number and the year in which the equipment was constructed
- The specific marking of explosion protection (Ex) followed by the symbol of the equipment group and the category.

'EN50 014 EN50 019 EN50 281' (optional), (Ex) 'EExell' Temperature Classification, (CE 0600 (Ex)), Gas and Dust Groups, Maximum Surface Temperature of the enclosure (T), IP rating, Certification Name and Number, 'DO NOT OPEN WHEN ENERGIZED', Maximum Dissipated Power (Watts), Volts and Amps.

Note: If the temperature range is outside the normal range of -20°C to +40°C, it must be marked on the label.

- For equipment Group II :-
the letter "G" where explosive atmospheres caused by gases, vapour or mists are concerned
and / or
the letter "D" where explosive atmospheres caused by dusts are concerned

Example:



6.2 Additional CE Marking

The CE conformity marking must consist of the initials CE and be followed by the identification number of the notified body responsible for production control.

Example: CE
0600



7.0 □ CE Marking ☐

The CE Marking is intended to facilitate the free movement of products within the European Union. By affixing CE marking to products, the manufacturer is making a legal declaration that the product meets with the appropriate requirements of all relevant European Directives. CE marking only applies to products within the scope of the Directives. It should not be applied to products if they are outside the

7.1 □ EMC, Electromagnetic Compatibility Directive

Most electrical and electronic products made or sold in the EU must: -

- Be constructed so they do not cause excessive electromagnetic interference and are not unduly affected by electromagnetic interference;
- In the case of certain radio-transmitting equipment, be subject to EC type examination by a notified body; and
- Carry CE marking

Cable glands are not considered to come within the scope of the Directive, however we have carried out independent third-party testing on the EMC shielding effectiveness of our armoured type cable glands fitted onto single wire armoured and braided-type cables. The electromagnetic ingress between the cable sample (perfect connection) and that of the cable sample fitted with the cable gland was of such a small magnitude that it could be regarded as within acceptable uncertainty of measurement. As such, it can be concluded that the shielding effectiveness of single wire armoured or braided cable is maintained when fitted with an appropriate Hawke armoured type cable gland.

7.2 □ Low Voltage Directive

The Low voltage Directive 73/23/EEC embodies a number of principles: -

- Only electrical equipment that does not jeopardise the safety of people, domestic animals and property, is permitted on the market.
- Only electrical equipment, that satisfies the CE marking requirements of the LVD, is in compliance.
- Electrical equipment is not required to be tested or marked for approval by an independent third party
- Enforcement is the responsibility of each member state within its national jurisdiction.
- The regulations apply to all electrical equipment, except where extensions apply, that is designed for use between 50 and 1000 volts ac or 75 and 1500 volts dc.
- Only components, which are in themselves "electrical equipment", need satisfy the Low Voltage Directive.

Cable glands are not in themselves "electrical equipment" and therefore do not fall within the scope of the LVD.

8.0 □ Certification / Listing / Approvals

Electrical equipment for use in potentially explosive atmospheres is usually certified, listed or approved by a recognised Certification Body or Test House. In Europe, there are numerous Certification Bodies such as BASEEFA 2001 Limited and SIRA in the UK. In North America, there are many recognised Certification Bodies and testing laboratories such as UL, FM and the CSA. The definition of "Approved" by the NEC is "Acceptable to the authority having jurisdiction". The definition "Listed" by the NEC is "Equipment, materials or services included in a list published by an organisation that is acceptable to the authority having jurisdiction". Further information is given in the NEC.





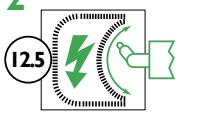
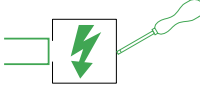
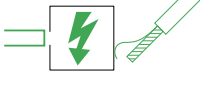
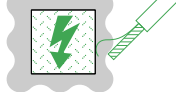

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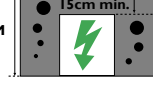
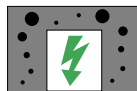
9.0 CENELEC and IEC Degree of Protection, IP Code

The standards EN 60529 and IEC 60529 describe a system for classifying the degrees of protection provided by the enclosures of electrical equipment as follows :-

First Number

0		Non-protected	Protection of persons against access to hazardous parts inside the enclosure and against solid foreign objects
1		Protected against objects of 50mm diameter and greater	An object probe, sphere of 50mm diameter, shall not fully penetrate
2		Protected against solid foreign objects of 12.5mm diameter and greater	An object probe, sphere of 12.5mm diameter, shall not fully penetrate
3		Protected against solid foreign objects of 2.5mm diameter and greater	An object probe, sphere of 2.5mm diameter, shall not penetrate at all
4		Protected against solid foreign objects of 1.0mm diameter and greater	An object probe, sphere of 1.0mm diameter, shall not penetrate at all
5		Dust-protected	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of apparatus or to impair safety
6		Dust-tight	No ingress of dust

Second Number

0		Non-protected	Protection of the equipment inside the enclosure against harmful effects due to the ingress of water
1		Protected against vertically falling water drops	Vertically falling drops shall have no harmful effects
2		Protected against vertically falling water drops when enclosure tilted up to 15°	Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical
3		Protected against spraying water	Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects
4		Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects
5		Protected against water jets	Water projected in jets against the enclosure from any direction shall have no harmful effects
6		Protected against powered water jets	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects
7		Protected against the effects of temporary immersion in water for 30 mins	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardised conditions of pressure and time
8		Protected against the effects of continuous immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7

Typical Designation : IP66



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The protection of the enclosure and the equipment inside against external influences or conditions, such as: mechanical impacts, corrosion, corrosive solvents, solar radiation, icing moisture (e.g. produced by condensation), and explosive atmospheres, are matters that should be dealt with by the relevant product Standard.

There are additional and supplementary optional letters to the above coding; these designators are A, B, C & D and H, M, S & V, and further information can be found in the relevant Standard(s).

9.1 □ Deluge Ingress Protection

On offshore facilities, equipment may be located in areas subject to emergency deluge systems. Equipment that has been evaluated as certified for use in hazardous areas may not be suitable for use in these locations. A testing method for electrical equipment to be installed in areas subject to deluge systems, DTS01, has been prepared by the Explosion and Fire Hazards Group of ERA Technology (now known as ITS) in collaboration with Shell UK Exploration and Production Ltd.

Testing includes: -

- Energising the equipment (where appropriate) for 60 minutes prior to the deluge test, then interrupting the electrical power at the start of the deluge test and resuming after 60 minutes until the completion of the deluge test.
- Carrying out insulation resistance testing before and after pre-conditioning and after the deluge test, where applicable.
- Carrying out pre-conditioning by exposure to vibration and thermal ageing at 90% relative humidity and at a temperature 20K above the equipments maximum service temperature and/or at least 80°C of any appropriate seals.
- Carrying out deluge test using a deluge chamber fitted with deluge nozzles that apply a salt water solution deluge pressure within the range of 3.5 bar to 4.5 bar at a water temperature in the range of 5°C to 10°C for 3-hours.

10.0 □ IECEx Scheme

The objective of the IECEx Scheme is to facilitate international trade in electrical equipment intended for use in potentially explosive atmospheres by eliminating the need for multiple national certification. The IECEx Scheme provides a means for manufacturers to obtain Certificates of Conformity that will be accepted at national level in all participating countries. A Certificate of Conformity may be obtained from any certification body accepted into the scheme. The objective of the IECEx Scheme is world-wide acceptance of one standard, one certificate, and one mark.

For the IEC scheme to achieve its objective, every applicable national standard will need to be identical to the corresponding IEC standard. A transition period will be necessary to allow time for participating IECEx Scheme countries to align their national standards with the IEC standards and work towards national acceptance of IECEx Certificates of Conformity and the IECEx mark.

11.0 □ North American Hazardous (Classified) Locations

11.1 □ Area Classification

Area classification is the division of a facility into a two or three-dimensional hazardous location, a non-hazardous location and the sub-division of the hazardous location into 'Divisions' or 'Zones'.

Hazardous (classified) locations may be sub-divided as follows: -



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In the United States of America, hazardous (classified) locations are sub-divided into three Zones or two Divisions, as follows: -

Class I, Flammable Gases, Vapors or Liquids	Class I, Flammable Gases, Vapors or Liquids
Division 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or some time under normal operating conditions.	Zone 0: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or for long periods at time under normal operation conditions.
Division 2: Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions	Zone 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist some of the time under normal operating conditions.
	Zone 2: Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions.

Class II, Combustible Dusts
Division 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or some time under normal operating
Division 2: Where ignitable concentrations of combustible dusts are not likely to exist under normal operating conditions

There is no Zone classification for dusts, fibres or flyings at present in the NEC

Class III, Ignitable Fibres and Flyings
Division 1: Where ignitable concentrations of ignitable fibres and flyings can exist all of the time or some of the time under normal operating conditions
Division 2: Where ignitable concentrations of ignitable fibres and flyings are not likely to exist under normal operating conditions



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For further information on the classification of hazardous (classified) locations see: -

NEC, NFPA 70 <input type="checkbox"/>	- <input type="checkbox"/> National Electric Code, NFPA 70
NFPA 30 <input type="checkbox"/>	- <input type="checkbox"/> Flammable and Combustible Liquids Code
NFPA 497 <input type="checkbox"/>	- <input type="checkbox"/> Recommended Practice for the Classification of Flammable
<input type="checkbox"/>	<input type="checkbox"/> Liquids, Gases or Vapours and of Hazardous (Classified)
<input type="checkbox"/>	<input type="checkbox"/> Locations for Electrical Installations in Chemical Process Areas
NFPA 499 <input type="checkbox"/>	- <input type="checkbox"/> Recommended Practice for the Classification of Combustible
<input type="checkbox"/>	<input type="checkbox"/> Dusts and of Hazardous (Classified) Locations for Electrical
<input type="checkbox"/>	<input type="checkbox"/> Installations in Chemical Process Areas
ANSI/API RP500 <input type="checkbox"/>	- <input type="checkbox"/> Recommended Practice for Classification of Locations for
<input type="checkbox"/>	<input type="checkbox"/> Electrical Installations at Petroleum Facilities Classified as
<input type="checkbox"/>	<input type="checkbox"/> Class I, Division 1 and Division 2
ANSI/API RP 505 <input type="checkbox"/>	- <input type="checkbox"/> Classification of Locations for Electrical Installations at
<input type="checkbox"/>	<input type="checkbox"/> Petroleum Facilities Classified as Class I, Zone 0, Zone 1
<input type="checkbox"/>	<input type="checkbox"/> or Zone 2

11.2 ☐ Apparatus selection according to Class I

Apparatus for use in Class I, Division 1

- Explosion-proof
- Intrinsically safe
- Purged / pressurised (type X or Y)

Apparatus for use in Class I, Division 2

- Any Class I, Division 1 method
- Non-incendive
- Non-sparking device
- Purged / pressurised (type Z)
- Hermetically sealed
- Oil immersion

Apparatus for use in Class I, Zone 2

- Intrinsic safety AEx ia
- Class I, Division 1 intrinsically safe

Apparatus for use in Class I, Zone 1

- Any Class I, Zone 0 method
- Any Class I, Division 1 method
- Flameproof, AEx d
- Increased safety, AEx e
- Intrinsic safety, AEx ib
- Purged pressurised, AEx p
- Powder filling, AEx q
- Oil immersion, AEx o
- Encapsulation, AEx m

Apparatus for use in Class I, Zone 0

- Any Class I, Zone 0 or 1 method
- Any Class I, Division 1 or 2 method
- Type of protection AEx n

Intrinsically safe equipment listed for use in Class I, Division 1, locations for the same gas or a permitted by Section 505-7(d) of the NEC, and with suitable temperature rating is permitted in Class I, Zone 0 locations.

Equipment approved for use in Class I, Division 1 or listed for use in Class I, Zone 0 locations for the same gas, or as permitted by Section 505-7(d) of the NEC, and with a suitable temperature rating is permitted in Class I, Zone 1 locations.

Equipment approved for use in Class I, Division 1 or Division 2 locations for the same gas, or as permitted by Section 505-7(d) of the NEC, and with a suitable temperature rating is permitted in Class I, Zone 2 locations.

Equipment listed as classified for use in Class I locations is not necessarily acceptable for Class II locations as it may not be dust-tight or operate at a safe temperature with a dust covering.



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11.3□ Apparatus selection according to the ignition temperature of the gas or vap

The equipment must be selected so that its maximum surface temperature will not reach the ignition temperature of the gas or vapor that may be present.

Temperature class of electrical apparatus	Maximum surface temperature of electrical apparatus	Ignition temperature of gas or vapour
T1	450°C	>450°C
T2	300°C	>300°C
T2A	280°C	>280°C
T2B	260°C	>260°C
T2C	230°C	>230°C
T2D	215°C	>215°C
T3	200°C	>200°C
T3A	180°C	>180°C
T3B	165°C	>165°C
T3C	160°C	>160°C
T4	135°C	>135°C
T4A	120°C	>120°C
T5	100°C	>100°C
T6	85°C	>85°C

Low ambient conditions require special consideration. Explosion proof of dust ignition proof equipment may not be suitable for use at temperatures lower than -25°C (-13°F) unless they are identified for low temperature service. Unless the equipment is marked otherwise, it is for use only in an ambient temperature range of -25°C (-13°F) to +40°C (+104°F).

Equipment that is approved for Class I and Class II should be marked with the maximum safe operating temperature.

For information regarding data for flammable gases and vapors, see NFPA 497 and NFPA 325.

11.4□ Apparatus selection according to the ignition temperature of the dust

The equipment must be selected so that its maximum surface temperature will be less than the ignition temperature of the specific dust.

For information regarding data for dusts, see NFPA 499.

11.5□ Apparatus selection according to apparatus grouping

Equipment that is approved for Class I and Class II should be marked with the maximum safe operating temperature.



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The grouping of Class I gases and vapors are classified into categories A, B, C and D.

Gas / Vapor Group
A (typical gas - acetylene)
B (typical gas - hydrogen)
C (typical gas - ethylene)
D (typical gas - propane)

The grouping of Class II dusts are classified into categories E, F, and G.

Dust Group
E (typical atmospheres containing combustible metal dusts)
F (typical atmospheres containing coal dusts)
G (typical atmospheres containing grain dusts)

11.6□ Apparatus Construction Standards

- | | |
|--------------------------------|--|
| ANSI / UL 1203□
□ | -□ Explosion-proof and Dust-ignition Proof Electrical Equipment for use in Hazardous (Classified) Locations |
| ANSI / ISA - S12.12□
□
□ | -□ Non-incendive Electrical Equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations. |
| ANSI / NFPA 496□
□ | -□ Standard for Purged and Pressurised Enclosures for Electrical Equipment. |
| ANSI / UL 913□
□ | -□ Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II and III, Division 1, Hazardous Locations. |
| ANSI / UL 698□
□ | -□ Industrial Control Equipment for use in Hazardous (Classified) Locations. |
| ANSI / UL 2225□
□ | -□ Metal-Clad Cables and Cable-Sealing Fittings for use in Hazardous (Classified) Locations. |
| UL 1604□
□ | -□ Electrical Equipment for use in Class I and II, Division 2 and Class III Hazardous (Classified) Locations. |
| ANSI / UL 2279□
□ | -□ Electrical Equipment for use in Class I, Zone 0, 1 and 2 Hazardous (Classified) Locations. |
| ISA S12.0.01□
□ | -□ Electrical Apparatus for use in Class I, Zone 0, 1 Hazardous (Classified) Locations, General Requirements. |
| ISA S12.22.01□
□ | -□ Electrical Apparatus for use in Class I, Zone 1 and 2 Hazardous (Classified) Locations, Type of Protection - Flameproof 'd' |
| ISA S12.16.01□
□ | -□ Electrical Apparatus for use in Class I, Zone 1 and 2 Hazardous (Classified) Locations, Type of Protection - Increased Safety 'e'. |



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11.7 Installation Standards and Codes

NEC, NFPA 70	- National Electrical Code (NEC)
USCG 45 CFR Parts 110 - 113	- Shipping, Sub-Chapter J, Electrical Engineering
ANSI / API RP 14F	- Recommended Practice for Design and Installation of
<input type="checkbox"/>	<input type="checkbox"/> Electrical Systems for Fixed and Floating Offshore
<input type="checkbox"/>	<input type="checkbox"/> Petroleum Facilities for Unclassified and Class I,
<input type="checkbox"/>	<input type="checkbox"/> Division 1 and Division 2 Locations.
API RP 14FZ	- Recommended Practice for Design and Installation of
<input type="checkbox"/>	<input type="checkbox"/> Electrical systems for fixed and floating offshore
<input type="checkbox"/>	<input type="checkbox"/> petroleum facilities for Unclassified and Class I,
<input type="checkbox"/>	<input type="checkbox"/> Zone 0, Zone 1 and Zone 2 Locations.

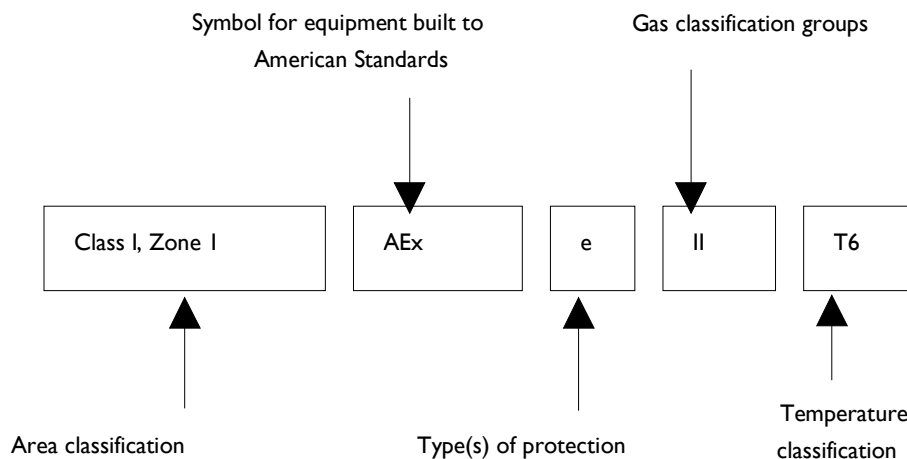
12.0 Wiring Systems

12.1 National Electrical Code (NEC) Zone Equipment Marking

Equipment that is listed for use in Class I, Zones as permitted by the NEC, should be marked as follows: -

- Class I, Zone 0 or Class I, Zone 1 or Class I, Zone 2 and
- Applicable gas classification group(s)
- Temperature classification

Example:



12.2 National Electrical Code (NEC) Division Equipment Marking

Equipment that is approved for use in Class I, Class II or Class III, Division 1 or 2 as permitted by the NEC, may be marked as follows: -

- Class I or Class II or Class III or a combination of where appropriate.
- Division 1 or Division 2 equipment not marked to indicate a Division or marked Division I is suitable for both Division 1 and 2 locations as defined in the NEC.
- Group classification.
- Operating temperature or temperature range or as permitted by the NEC.



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12.3 North American Ingress Protection

Non-Hazardous Locations

NEMA Enclosure Type Number	Application
1	For indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt.
2	For indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, and to provide a degree of protection against dripping and light splashing of liquids.
3	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.
3R	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, and snow; and that will be undamaged by the external formation of ice on the enclosure.
3S	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.
4	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.
4X	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, and corrosion; and that will be undamaged by the external formation of ice on the enclosure.
5	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against settling airborne dust, lint, fibres, and flyings; and to provide a degree of protection against dripping and light splashing of liquids.
6	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against hose-directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.
6P	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against hose-directed water and the entry of water during prolonged submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.
12	Enclosures constructed (without knockouts) for indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against circulating dust, lint, fibres, and flyings; and against dripping and light
12K	Enclosures constructed (without knockouts) for indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against circulating dust, lint, fibres, and flyings; and against dripping and light splashing of liquids.
13	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against circulating dust, lint fibres, and flyings; and against the spraying, splashing, and seepage of water, oil, and non-corrosive coolants.

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Hazardous Locations

Enclosure Type Number	Application
7	For indoor use in hazardous locations classified as Class I, Division I, Groups A, B, C, or D as defined in NFPA 70.
8	For indoor use in hazardous locations classified as Class II, Division I, Groups E, F, or G as defined in NFPA 70.
9	For indoor use in hazardous locations classified as Class II, Division I, Groups E, F, or G as defined in NFPA 70.

Further information can be found in NEMA Standard Publication 250 and UL 50 Standard Publication.

The enclosures are designed to protect and to provide additional protection as stated below: -

NEMA Enclosure Type	IEC and CENELEC 60529
1	IP10
2	IP11
3	IP54
3R	IP14
3S	IP54
4 and 4X	IP56
5	IP52
6 and 6P	IP67

The IEC and CENELEC 60529 Standards and NEMA degrees of protection can not be fully compared as equivalent ratings. The NEMA Standard includes tests for environmental conditions such as mechanical damage, corrosion, rusting, ice formation, etc.

13.0 Abbreviations, Acronyms and Definitions

ABS	American Bureau of Shipping. ABS is a ship classification society involved with establishing and administering of standards and rules for marine vessels and structures.
AEx	A marking prefix for apparatus complying with one or more types of explosion protection techniques for installation in accordance with Article 505
ANSI	American National Standards Institute
API	American Petroleum Institute
ATEX	EU Directive 94/9/EC Equipment and protective systems intended for use in potentially explosive atmospheres



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Abbreviations, Acronyms and Definitions (cont'd)

BASEEFA	British Approvals Service for Electrical Equipment in Flammable Atmospheres. They provide a range of testing and certification services primarily related to equipment and systems intended for use in potentially explosive atmospheres. BASEEFA is a constituent of EECS - a branch of the Health & Safety Executive,
BASEEFA (2001) Ltd	They provide a range of testing and certification services primarily related to equipment and systems intended for use in potentially explosive atmospheres.
CEC	Canadian Electric Code. The CEC, Part I, CSA Standard C22.1, is a safety standard for the installation and maintenance of electrical equipment.
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardization. CENELEC is a European Standards Organisation that publishes harmonised standards for the European market. CENELEC comprises the National Committees of the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.
CEPEL	Centro de Pesquisas de Energia Electrica (Brazil). In Brazil, all electrical or electronic equipment for use in potentially explosive atmospheres should be certified by a Brazilian certification body recognised by INMETRO. CEPEL is an accredited body that is able to issue relevant certification.
CFR	Code of Federal Regulations
Cold Flow	Certain types of cable employ materials that can exhibit "cold flow" characteristics that could have adverse effects on the protection of the apparatus. Where such cable is used, a suitable cable entry device should be employed, for example cable entry devices not employing compression seals that act upon the part(s) of the cable having "cold flow" characteristics. "Cold flow" can be more fully described as thermoplastic materials that flow when subjected to pressure at ambient temperature.
CSA	Canadian Standards Association. A service they offer includes testing and certification services to US and Canadian Standards, as well as international certification through agreements with other approval authorities.
DNV	Det Norske Veritas
EECS	Electrical Equipment Certification Service (UK). They provide a range of testing and certification services primarily related to equipment and systems intended for use in potentially explosive atmospheres. EECS has two divisions, the Mining Equipment Certification Services (MECS), and BASEEFA. The EECS is a branch of the Health & Safety Executive, UK.
EEx	A marking prefix for apparatus complying with one or more types of explosion protection techniques in accordance with CENELEC standards.

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Abbreviations, Acronyms and Definitions (cont'd)

Explosionproof	A term used to describe equipment that is capable of withstanding an explosion of a specified gas or vapour that may occur within it and preventing the ignition of a specified gas or vapour surrounding it.
Flameproof	A type of protection of electrical apparatus in which the enclosure will withstand an internal explosion of a flammable mixture which has penetrated into the interior, without suffering damage and without causing ignition, through any joints or structural openings in the enclosure, of an external explosive atmosphere consisting of one or more of gases or vapours for which it is designed.
FM	Factory Mutual Research Corporation (USA). Services they offer include the testing and approval of electrical equipment in accordance with US and international Standards.
Hazardous Areas	Locations where fire or explosion hazards may exist due to the presence of flammable gases, vapours, mists, ignitable fibres or dusts
IADC	International Association of Drilling Contractors
IEC	International Electrotechnical Commission. Founded in 1906, the IEC is the world organisation that prepares international standards for all electrical, electronic and related technologies. The membership consists of more than 50 participating countries.
IECEX	The aim of the IECEX Scheme is to facilitate international trade in electrical equipment intended for use in potentially explosive atmospheres by eliminating the need for multiple national certificates.
Increased Safety	A type of protection applied to electrical apparatus that does not produce arcs or sparks in normal service and under specified abnormal conditions, in which additional measures are applied so as to give increased security against the possibility of excessive temperatures and of the occurrence of arcs and sparks
INMETRO	Instituto Nacional de Metrologia, Normalização Qualidade Industrial (Brazil)
Intrinsically Safe System	An assembly of interconnected items of apparatus which may comprise intrinsically safe apparatus, associated apparatus and other apparatus, and interconnecting cables in which the circuits within those parts of the system that may be exposed to explosive gas atmospheres are intrinsically safe circuits
Impervious Sheathed Cable	Cable constructed with an impervious metallic or non-metallic overall covering that prevents the entrance of gases, moisture or vapours into the insulated conductor or cable
IP	A system of rating standard levels of Ingress Protection provided by the
ISA	The International Society for Measurement and Control (formerly Instrument Society of America)
ISO	International Organisations for Standardisation. A worldwide federation of national standard bodies from 130 countries. ISO's mission is to promote the development of standardisation to facilitate international exchange of goods service.
ITS	Intertek Testing Services



Technical Data

Hawke Enclosures

Abbreviations, Acronyms and Definitions (cont'd)

Marine Shipboard Cable	Impervious sheathed armoured or non-armoured cable constructed in accordance with UL 1309/CSA C22.2 No. 245, except that an overall impervious sheath is required over the armoured construction, and listed as "Shipboard Cable, Marine" by a Nationally Recognised Testing Laboratory (NRTL)
Maximum Surface Temperature	The highest temperature of a surface accessible to a flammable mixture under conditions of operation and within the ratings of the equipment
MC Cable	Metal-clad cable as defined by NEC Article 334
MC-HL Cable	Metal-clad cable for hazardous locations as defined in UL 2225
NEC	National Electric Code ® (ANSI/NFPA 70)
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor National Recognised Test Laboratories (NRTL's) recognised by OSHA include CSA, FMRC and UL. The NRTL determines that the specific products meet the relevant standards of safety as required by OSHA and that the products are safe for use in the U.S. workplace. For further information, refer to OSHA's web site at www.osha.gov
PLTC	Power-limited tray cable as defined by NEC article 725
Potentially Explosive Atmosphere	A mixture with air, under atmospheric conditions, of flammable substances in the form of a gas, vapour, mist or dust in which, after ignition, combustion spreads through the un-consumed mixture.
SCS	SIRA Certification Service (UK). They provide a range of testing and certification services and have agreements with other international approval authorities.
TC	Power and control cable as defined by NEC Article 340
UL	Underwriters Laboratories Inc ® (USA)
USCG	United States Coast Guard

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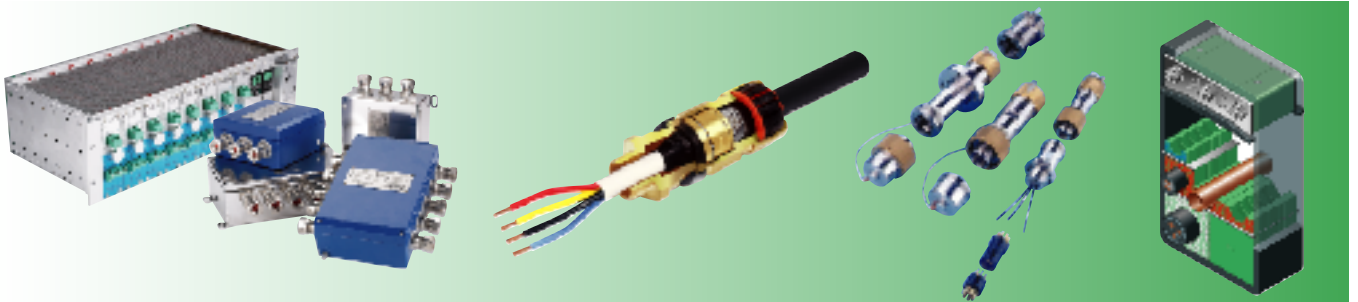


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