

Exd Connectors for Harsh and Hazardous Locations



FOR CUSTOMERS WHO DEMAND THE BEST

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

EX CONNECTOR PROJECT LIST

APPLICATION			
Project name	Owner	Location	Application
Snohvit	Statoil	Norway	Connectors used on WOCS Topside electrical surface jumpers
Simian/Sienna/Sapphire	Burullus	Egypt	Power and communication for BUICS and IWOCs controls containers
BP Clair	BP	UK	Topside module hook-up
Kristin	Statoil	Norway	Sub-sea workover station
ACG	AIOC	Azerbaijan	Used on platform drill head for mobility
Captain	Chevron Texaco	UK	Supply electrical signal to a secondary module beside original platform
Conoco Immingham CHP	Conoco Global Power	UK	Installed to actuators which control and monitor gas being induced into the turbines
Enfield RTM	Woodside Energy	Australia	Used on Turret mooring system
FPSO OKHA	Woodside	Sakhalin	Used on swivel turret bypass system

Termination Service

Hawke International has over 50 years of experience in hazardous area connection systems and have a wealth of experienced staff able to provide assistance in the planning and selection of Ex connectors and related products. Termination work can be arranged by Hawke International as part of their connection solution, both at our premises across the globe or on-site as required. The company have dedicated installation engineers able to offer complete termination services including cable preparation, marking, gland and connector termination and complete unit testing. This simplifies even further the use of Hawke connectors as part of your connection requirements.

PAGE	DESCRIPTION
46	Hazardous area connector range - Common features
47	Hazardous area connector range - Selection overview
48-49	Instrum ^{Ex} Features
50	Instrum ^{Ex} How it works
51-53	Instrum ^{Ex} Inserts and Dual crimp - Order code - Dimensions (Technical)
54-55	Control ^{Ex} Features
56-59	Control ^{Ex} Inserts - Order code - Dimensions - Calculations (Technical)
60-61	Power ^{Ex} Features
62-65	Power ^{Ex} Inserts - Order code - Dimensions - Calculations (Technical)
66	Information - Connector selection application, Short circuit testing, Crimp tool, Electronic data CD Rom

There are several innovative features common across the range of Hawke connectors.

Despite their highly advanced design and technical features, the range is extremely simple to use and quick to terminate.



Impossible to cross mate

The unique mechanical keying system prevents contact damage and ensures safe use by eliminating the possibility of misconnection of circuits. Machined key and keyway also ensures connector alignment.



Ingress and deluge protected

All Hawke ATEX connectors meet the requirements of IP66 and IP67 to IEC60529. They are also deluge protected to DTS01 offering long term protection in onerous environments.



High reliability contacts

Each pin and socket is fitted with multilam technology to ensure reliable low resistance connection on each coupling.



Retro fit flange option

Each connector plug and receptacle can be fitted with an optional mounting flange, either at point of order or retro fitted as required, allowing easy mounting of the connectors without the need to disassemble the units.



Robust design

Designed and constructed for the most demanding environments, Hawke connectors are durable in almost any environment, requiring no routine maintenance to ensure continued performance.

Hawke International connectors are ideal for use in gas hazardous areas commonly found in Oil and Gas exploration, production and process plants. Their features, however, also offer numerous benefits in explosive dust environments as well as harsh and hostile non-explosive applications where temporary but safe disconnection of power is critical. Hawke International's Ex range of connectors permit the safe and rapid service, repair and replacement of key plant, provide quick connection to temporary and permanent equipment and greatly reduce hook-up time in capital-intensive processes.

The Ex range of connectors cover three main application areas: Instrumentation, Control and Power.

For a guide as to which Ex connector may be best suited to an individual application the table below outlines the main variables.

APPLICATION							
Connector Type	Minimum Number of Pins	Maximum Number of Pins	Minimum cross sectional area of Conductor mm ²	Maximum Conductor mm ²	Maximum Voltage	Maximum Current (amps)	Live Demate
Instrum ^{Ex}	1	8	0.14	2.5	250V	10	✓
Control ^{Ex}	3	60	0.5	35	660V	125	X
Power ^{Ex}	1	4	50	630	750V*	780	X

* Other voltages available on special request.



Instrum^{Ex}

Tamb: -40°C to +60°C. II2 GD Exde IIC ExtD T85. IP66, 67 and DTS01 deluge protected. Certificate No's Baseefa06ATEX0061X and IECEx BAS 06.0018X.
This revolutionary design allows the live mate and de-mating of signal and low power in hazardous areas safely and quickly. The Instrum^{Ex} connector is available with two insert options: the 4-way option will accept cores ranging between 0.5mm² and 2.5mm² and can operate up to a maximum current of 10A (AC1) at 250V AC & 2.5A (DC1) 60V DC. The 8-way option, designed predominantly for Ethernet applications, will accept cores ranging between 0.14mm² and 0.37mm² and can carry 1A (AC1) at 60V AC & 0.5A (DC1) 60V DC. Instrum^{Ex} connectors include an integral Hawke cable gland for easy termination of both armoured and un-armoured cables.



Control^{Ex}

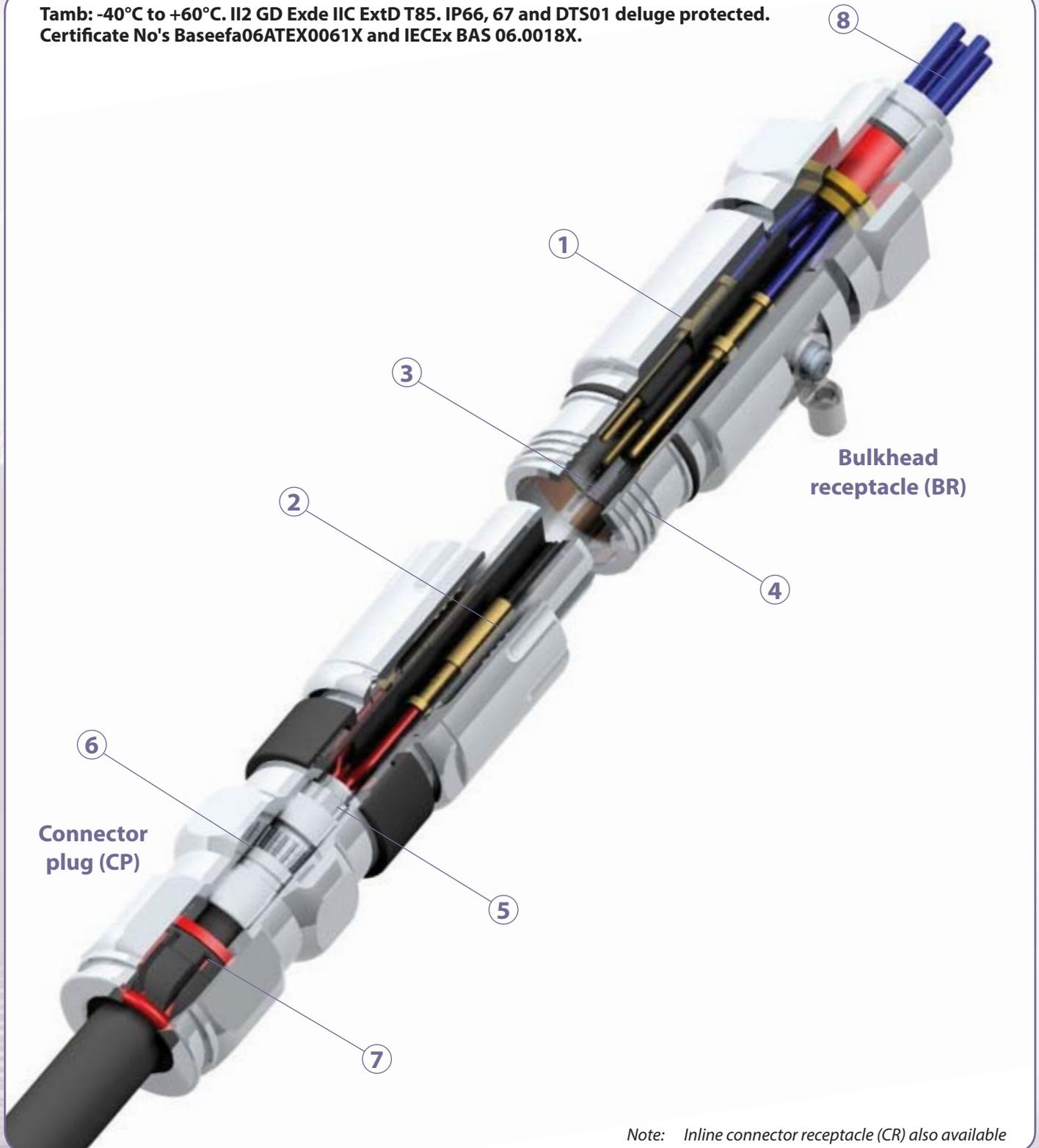
Tamb: -40°C to +60°C. II2 GD Exd IIC ExtD T95. Extb IIIC Db. IP66, 67 and DTS01 deluge protected. Certificate No's Baseefa03ATEX0355X and IECEx BAS 08.0063X.
The 3rd generation of Control^{Ex} connectors include many features and refinements as a result of consumer feedback, which makes them particularly suitable for control and low/medium power applications. The robust stainless steel body can hold up to 60 contacts and will accept conductor sizes ranging between 0.5mm² and 35mm², operating up to 125A and 660V.



Power^{Ex}

Tamb: -40°C to +60°C. II2 GD Exd IIC ExtD T85. IP66, 67 and DTS01 deluge protected. Certificate No's Baseefa06ATEX0062X and IECEx BAS 06.0019X.
The Power^{Ex} range of connectors have been designed specifically for the extremely demanding requirements of higher power applications. Inserts are available with 1 to 4 contacts with a conductor acceptance range of between 50mm² and 630mm² operating up to 780A and 750V as standard. Other voltages available on special request.

**Tamb: -40°C to +60°C. II2 GD Exde IIC ExtD T85. IP66, 67 and DTS01 deluge protected.
Certificate No's Baseefa06ATEX0061X and IECEx BAS 06.0018X.**





1

Electrical Insert with Key

Easy to assemble electrical insert allows crimped or soldered connections.



5

Anti-rotation

Profiled Spigot and connector body prevent cable rotation, eliminating cable damage.



2

Keyed Positions

Secondary keying on the actual insert bodies guarantees contact alignment, preventing pin damage.



6

Reversible Armour Clamp

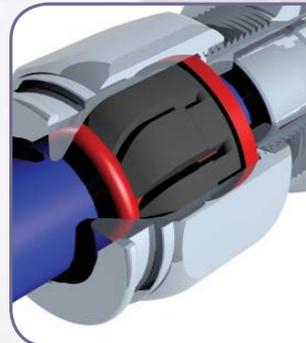
The Instrum  incorporates Hawke's proven and patented armour termination method to accommodate different types of armour or braid.



3

Integral Keying

Machined key and keyway ensures connector alignment. Unique 5 position insert keying system prevents cross-mating.



7

Versatile LSFZH Rear Seal

Accommodates a wide range of cable sizes and provides highly effective cable grip and ingress protection.



4

Quick Connect

Unique 4 start ACME thread offers a smooth and quick fully mating action in less than two turns. Earth continuity is achieved via a 360° contact clip.

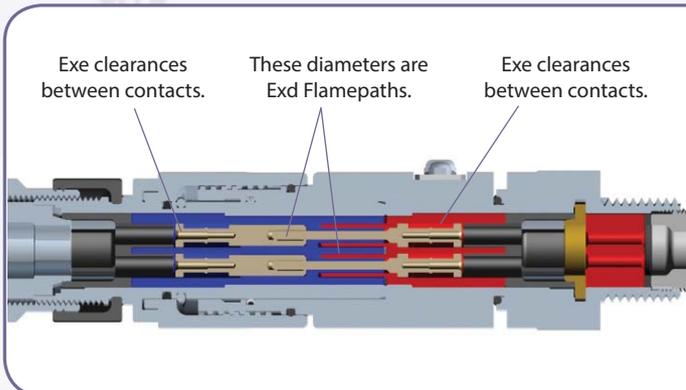


8

Pre-terminated

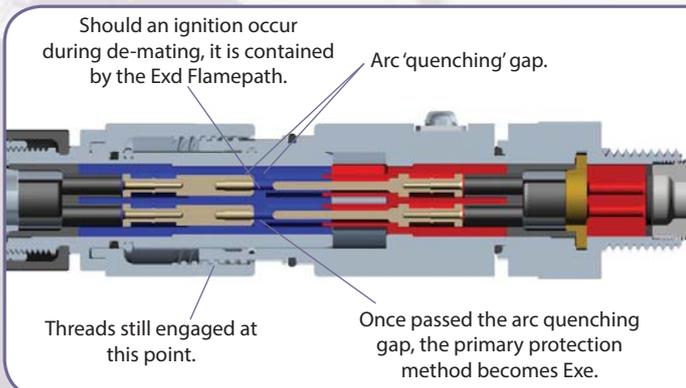
All BR connectors are supplied with pre-terminated tails to suit your requirements.

The **Instrum ** connectors are designed to provide ease of installation and speed of use whilst providing a flexible, safe and reliable method for **mating and disconnection of circuits which are energised**.



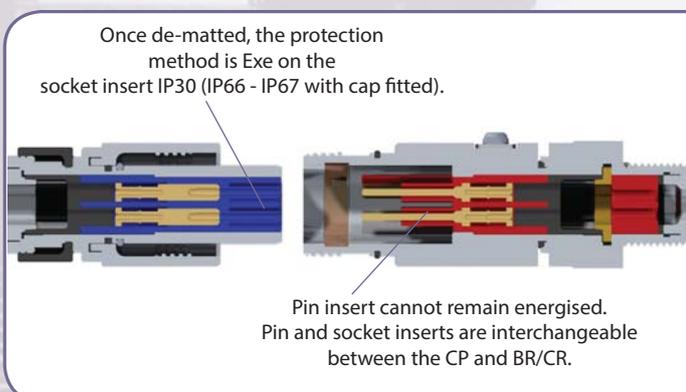
Stage 1

The two mating halves are easily engaged and disengaged by two full turns of the ACME custom engaging thread, during which time the pins and socket are protected by the Exd flameproof protection concept. The outer shell of the connector combined with the integral Hawke cable gland seal ensure that the internal connections are protected to the Exe increased safety protection concept.



Stage 2

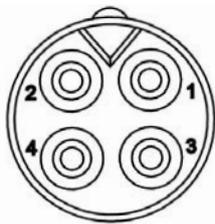
During connector engagement and disengagement any sparking of the contacts is contained within an arc 'quenching section' which is housed within the Exd flamepath areas.



Stage 3

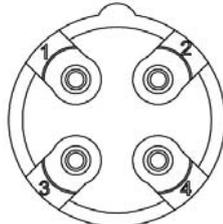
When the connector halves are disengaged, the socket section is protected to IP30 and must have the protective cap fitted immediately to restore the full Exe increased safety requirements and IP rating. The pins and socket inserts are interchangeable between all three connector components: i.e. Bulkhead receptacle, in-line receptacle and connector plug. **In all installations, the "live" side of the connector must always contain the socket insert.**

**Front view of
socket insert**



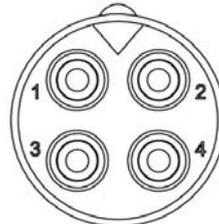
4 x 0.5 - 1mm²
4 x 1.5 - 2.5mm²

**Back view of
socket insert**



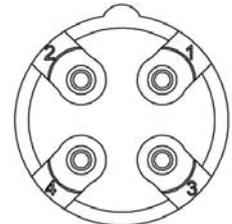
4 x 0.5 - 1mm²
4 x 1.5 - 2.5mm²

**Front view of
pin insert**



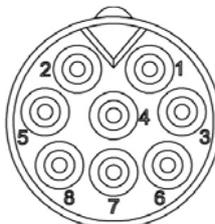
4 x 0.5 - 1mm²
4 x 1.5 - 2.5mm²

**Back view of
pin insert**



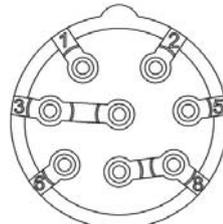
4 x 0.5 - 1mm²
4 x 1.5 - 2.5mm²

**Front view of
socket insert**



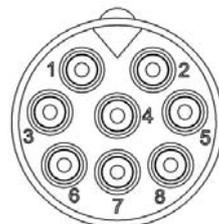
8 x 0.14 - 0.37mm²

**Back view of
socket insert**



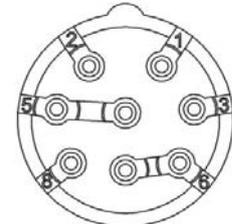
8 x 0.14 - 0.37mm²

**Front view of
pin insert**

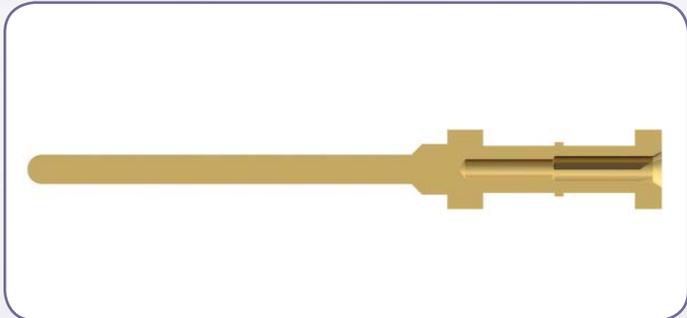


8 x 0.14 - 0.37mm²

**Back view of
pin insert**



8 x 0.14 - 0.37mm²



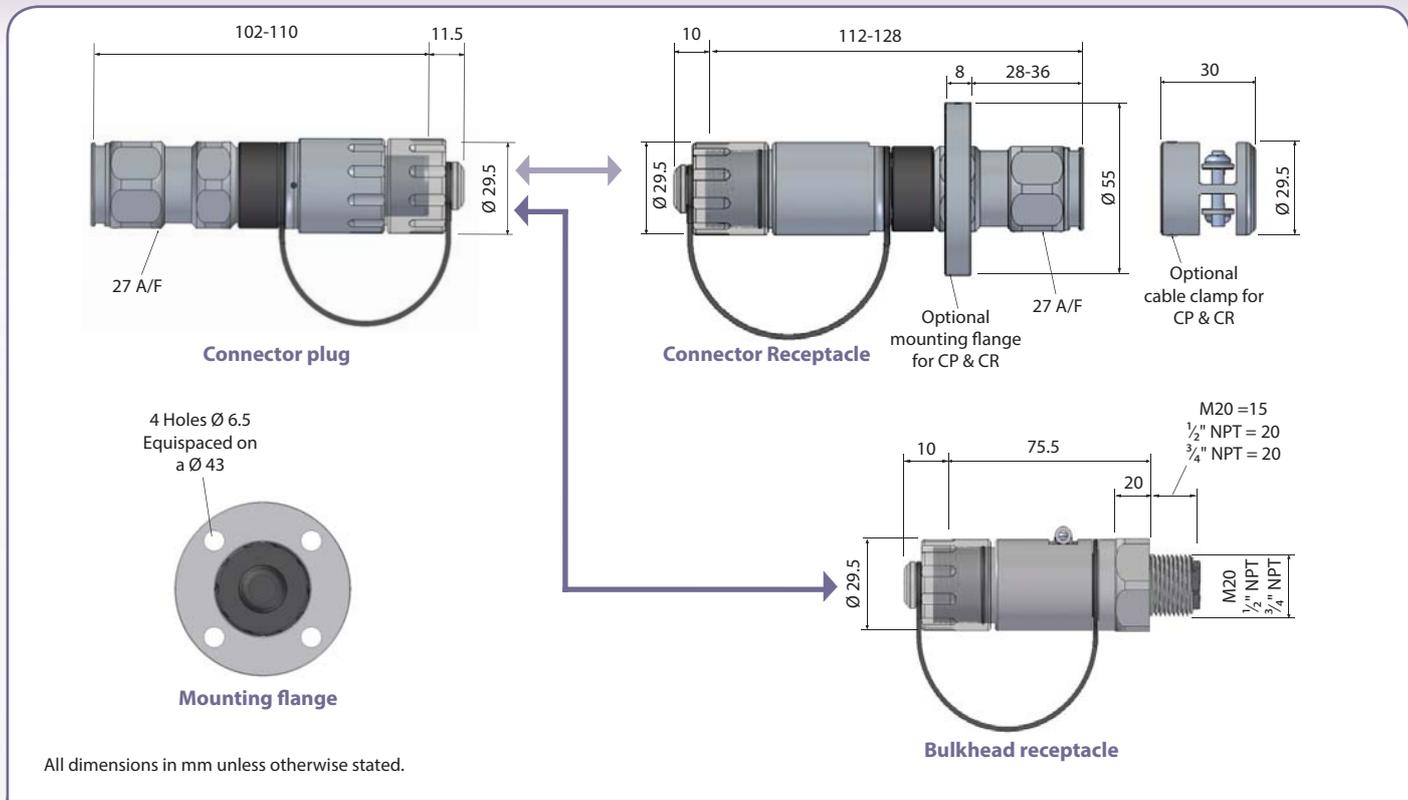
Dual Crimp

Two crimping locations on the 4 way contacts allow for only two contact sizes to cover a far greater range than conventional contacts. This allows termination of cores ranging between 0.5 and 2.5mm².

Contacts must be crimped using the Hawke supplied crimping tool part No. HCT1.

When ordering, select relevant code from each block as shown in the **example below: Instrum**  **/ N-BR1-M-B-P-X-0-4-X-A**

Instrum 	SELECT CODE	DESCRIPTION	EXAMPLE CODE
MATERIAL	N	Nickel Plated Brass	N
	S	Stainless Steel	
CONNECTOR STYLE	CP	Connector Plug	BR1
	FP	Flanged Connector Plug	
	CR	Connector Receptacle	
	FR	Flanged Connector Receptacle	
	BR1	Bulkhead Receptacle (Fixed Pos 1 Std)	
	BR2	Bulkhead Receptacle (Fixed Pos 2)	
	BR3	Bulkhead Receptacle (Fixed Pos 3)	
	BR4	Bulkhead Receptacle (Fixed Pos 4)	
	BR5	Bulkhead Receptacle (Fixed Pos 5)	
BULKHEAD ENTRY THREAD	M	Metric M20 (standard)	M
	N	NPT 1/2"	
	X	N/A (for CP or CR)	
CROSS SECTIONAL AREA	A	4 x 0.5 - 1mm ² *	B
<i>* 4 way Bulkhead Receptacle will always be pre-terminated with 1.5mm² conductors, irrespective of cross sectional area.</i>	B	4 x 1.5 - 2.5mm ² *	
	C	8 x 0.14 - 0.37mm ²	
INSERT TYPE	P	Pin Insert **	P
<i>** Note: In all installations the "live" side of the connector must always contain the socket insert.</i>	S	Socket Insert **	
OUTER SHEATH DIAMETER	S	Cable Seal (2 Seals) 5.5 - 16mm	X
	X	N/A (Bulkhead Receptacle)	
BULKHEAD RECEPTACLE CABLE LENGTH	0	0.5m (standard)	0
	1	1m	
	2	2m	
	C	Customer Specified	
	X	N/A (for Connector Plug and Receptacle)	
BULKHEAD RECEPTACLE PIN QUANTITIES #	4	4 (pins 1-4 terminated) Std. 4 way [#]	4
<i># Bulkheads also include an additional earth lead</i>	3	3 (pins 1,2 and 3 terminated) 4 way [#]	
	2	2 (pins 1 and 3 terminated) 4 way [#]	
	8	8 (pins 1-8 terminated) Std. 8 way [#]	
	C	Customer Specified	
	X	N/A (for Connector Plug and Receptacle)	
ARMOUR CLAMP SIZE	U	Unarmoured/Copper Braid (will add outer sheath clamp)	X
	X	N/A (Bulkhead Receptacle)	
	S	Clamping Ring 0-1.25mm	
CERTIFICATION	A	ATEX/IECEX	A
	G	GOST	



TECHNICAL DATA - 4 WAY	
Explosion Protection	Ex II 2 G Exde IIC ExtD T85°C A21 ATEX Exde IIC ExtD T85°C A21 IECEx
Ambient Temperature	-40°C to +60°C
Certification	Baseefa 06 ATEX 0061X IECEx BAS06.0018X
Ratings 4 way	Voltage AC 250V Current AC EN 60947-4-3 10A (AC21) Current AC EN 60947-4-1 10A (AC1) Current AC EN 60947-4-1 1A (AC3) Frequency 50/60 Hz Power Factor 0.9 Voltage DC 60V Current DC EN 60947-4-3 2.5A (DC21) Current DC EN 60947-4-1 2.5A (DC1) Current DC EN 60947-4-1 0.5A (DC3)
Fuse Rating 4 way	10 amp without thermal protection 20A gL with thermal protection
Max No. of make & break operations (EN61984)	On load 150 Off load 500
IP Rating	IP66, IP67 and DTS01 deluge protected. Note: Caps to be fitted to maintain IP ratings when the connector halves are separated.
Storage Temperature	-50°C to +70°C

TECHNICAL DATA - 8 WAY	
Explosion Protection	Ex II 2 G Exde IIC ExtD T85°C A21 ATEX Exde IIC ExtD T85°C A21 IECEx
Ambient Temperature	-40°C to +60°C
Certification	Baseefa 06 ATEX 0061X IECEx BAS06.0018X
Ratings 8 way	Voltage AC 60V Current AC EN 60947-4-3 1A (AC21) Current AC EN 60947-4-1 1A (AC1) Current AC EN 60947-4-1 0.1A (AC3) Frequency 50/60 Hz Power Factor 0.9 Voltage DC 60V Current DC EN 60947-4-3 0.5A (DC21) Current DC EN 60947-4-1 0.5A (DC1) Current DC EN 60947-4-1 0.1A (DC3)
Fuse Rating 8 way	2 amp without thermal protection 5A gL with thermal protection
Max No. of make & break operations (EN61984)	On load 150 Off load 500
IP Rating	IP66, IP67 and DTS01 deluge protected. Note: Caps to be fitted to maintain IP ratings when the connector halves are separated.
Storage Temperature	-50°C to +70°C



Tamb: -40°C to +60°C  II2 GD Exd IIC Gb, Extb IIIC T95Db. IP66, 67 & DTS01 deluge protected.
Certificate No's Baseefa12ATEX0014X & IECEx BAS 12.0006X.



Connector Plug-CP



Bulkhead-BR



Connector Plug-CR

Note: Inline connector receptacle (CR) also available

Hazardous Area Connectors

Certified ATEX / IECEx / GOST / NEC 505

Control Features



①

Easy Fieldwireable

Pin and socket inserts are numbered front and back to assist wiring and avoid termination errors. Crimp and solder inserts available.



⑤

Running Coupler

Allows the connector to be installed onto a pre-assembled cable gland. Connector is rear loading and includes locking engaging nut.



②

Internal Keyway Spacer

Eases accessibility for termination as tube fitted after termination complete, along with allowing easy installation into the required keyed position (See ④)



⑥

Acme Thread at Mating Interface

Unique ACME thread offers a smooth and quick fully mating action.



③

Locking Pin

Optional locking pin provides the facility for mated connectors to be permanently locked, via the use of a padlock, ensuring they cannot be separated under load. *(Padlock not supplied)*



⑦

Fully Inspectable Flameproof Barrier

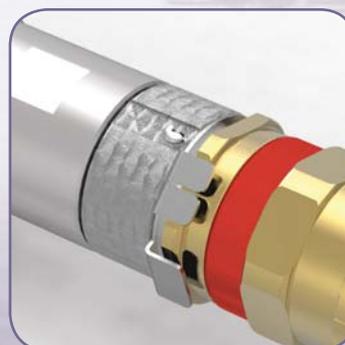
Provides direct inspection of the flameproof seal and offers users the peace of mind that the connector is safe for installation.



④

Keying Position

The unique visual 5 position insert keying system (3 on Ex16) along with the integral machined keyways prevent contact damage and ensures safe use by eliminating the possibility of misconnection of adjacent circuits.



⑧

Anti-Rotation Device

Connector plugs and receptacles come complete with anti-rotation ring, which when fitted between the connector and gland, helps to eliminate the possibility of the gland loosening, locking this in position.

TABLE		
Insert Size	Internal Diameter of cup (mm) Nominal	
	Soldered	Crimped
1.5mm ²	2	2
2.5mm ²	3	3
6mm ²	3.5	3.2
10mm ²	7	4
16mm ²	7	5
25mm ²	8	6.5
35mm ²	8	8.3

INSERT SELECTION TABLE					
Configuration					
Shell size 16	Shell Size 25	Shell Size 32	Shell Size 40	Shell Size 50	Shell Size 63
3 x 1.5mm ² + Earth	4 x 1.5mm ² + Earth	12 x 1.5mm ² + Earth	24 x 1.5mm ² + Earth	37 x 1.5mm ² + Earth	49 x 1.5mm ² + Earth
4 x 1.5mm ² + Earth	9 x 1.5mm ² + Earth	19 x 1.5mm ² + Earth	30 x 1.5mm ² + Earth	27 x 2.5mm ² + Earth	60 x 1.5mm ² + Earth
-	12 x 1.5mm ² + Earth	10 x 2.5mm ² + Earth	19 x 2.5mm ² + Earth	13 x 6mm ² + Earth	37 x 2.5mm ² + Earth
-	4 x 2.5mm ² + Earth	12 x 2.5mm ² + Earth	4 x 25mm ² + Earth	-	-
-	7 x 2.5mm ² + Earth	4 x 6mm ² + Earth	4 x 35mm ² + Earth	-	-
-	4 x 6mm ² + Earth	6 x 6mm ² + Earth	-	-	-
-	-	3 x 10mm ² + Earth	-	-	-
-	-	4 x 10mm ² + Earth	-	-	-
-	-	3 x 16mm ² + Earth	-	-	-
-	-	4 x 16mm ² + Earth	-	-	-

Note: Inserts for use in bulkhead receptacles are solder termination only for contact sizes of 6mm² and above.

Hawke Control^{Ex} connectors have a maximum working voltage of 660V DC (660V AC) as standard. 3rd & 4th generation Control^{Ex} connectors can be connected together within certification. Other voltages available on special request.

Hazardous Area Connectors

Certified ATEX / IECEx / GOST / NEC 505

Control^{Ex} Code

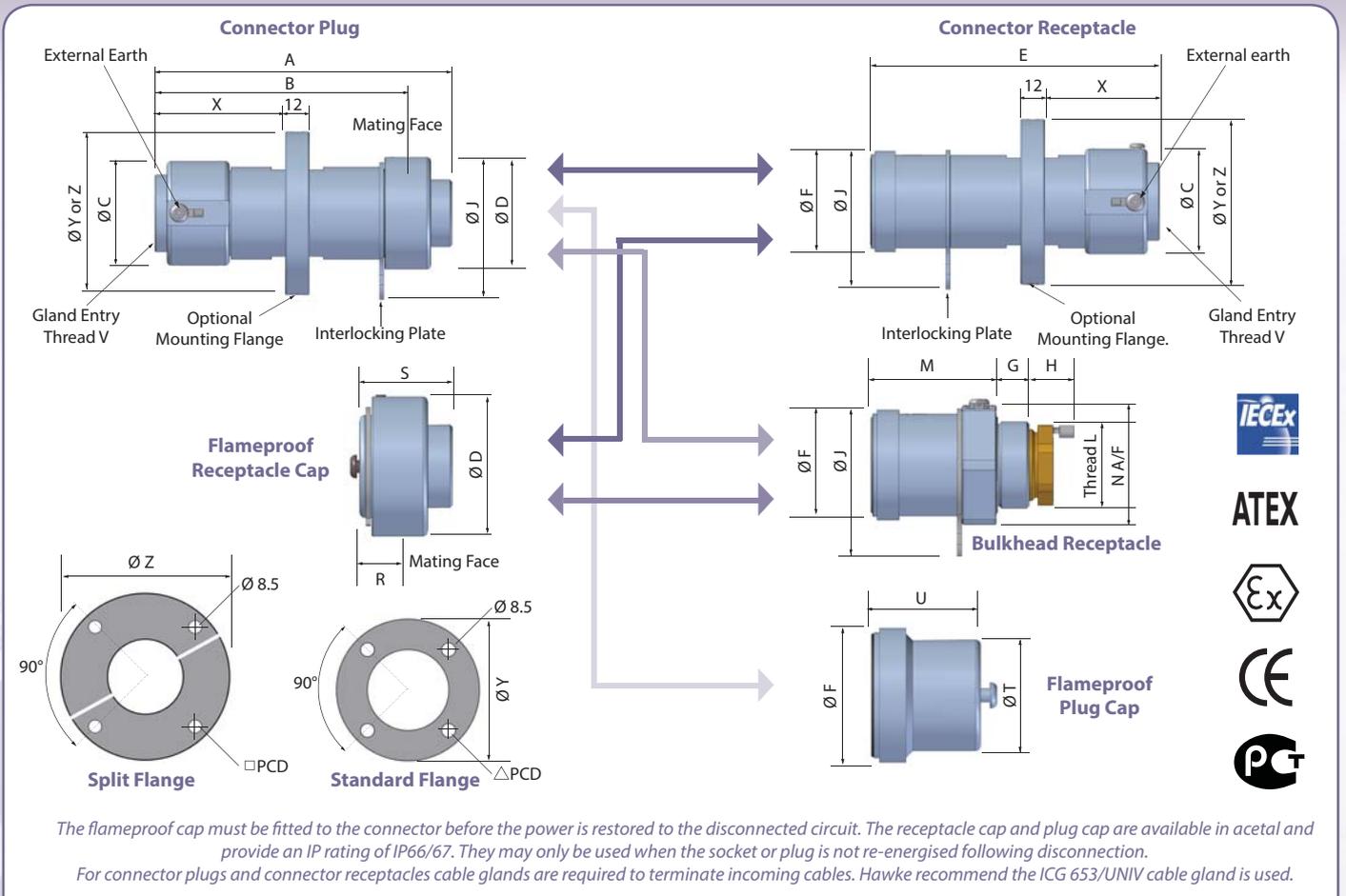
Hawke International does not recommend the use of their Control^{Ex} Connectors in applications where rigid PVC/SWA/PVC power cabling (typically to BS 6346 standards or equivalents) is used in portable/semi-portable applications.

When ordering, select relevant code from each block as shown in the example below:

Control^{Ex} / Exd-32-S-CP-V-19 x 1.5-S-C-FL-FPC-P-R25-A-1-T

Control ^{Ex}	SELECT CODE	DESCRIPTION	EXAMPLE CODE
PROTECTION	Exd	Flameproof	Exd
SHELL SIZE	16	16	32
	25	25	
	32	32	
	40	40	
	50	50	
	63	63	
MATERIAL	S	Stainless Steel	S
CONNECTOR STYLE	CP	Connector Plug	CP
	CR	Connector Receptacle	
	BR	Bulkhead Receptacle	
KEYING SYSTEM	V	Variable Keyway (All)	V
	F	Fixed Keyway <i>(only available if purchasing terminated)</i>	
NUMBER OF CONTACTS		See Insert Selection Chart	19
	X	No Insert	
CONTACT SIZE		See Insert Selection Chart	1.5
INSERT TYPE	P	Pin	
	S	Socket	
	X	No Insert	S
TERMINATION STYLE	S	Solder*	
	C	Crimp*	
	X	No Insert	C
<i>* Note: Inserts for use in Bulkhead receptacles are solder termination only for contact sizes of 6mm² and above.</i>			
FLANGE TYPE [♦]	FL	Mounting Flange	FL
<i>Note: CP or CR only - one per mating pair.</i>	SF	Split Flange <i>(can be retro fitted after termination)</i>	
CAP TYPE	FRC	Flameproof Receptacle Cap	FPC
	FPC	Flameproof Plug Cap	
	PRC	Plastic Receptacle Cap	
	PPC	Plastic Plug Cap	
LOCKING PIN [♦]	P	Locking Pin <i>(only one required per mating pair)</i>	P
ALTERNATIVE CABLE GLAND ENTRY [♦]	R20	Reduced Cable Gland Entry M20 <i>(Ex 25 only)</i>	R25
	R25	Reduced Cable Gland Entry M25 <i>(Ex 40 & Ex 32 only)</i>	
	R32	Reduced Cable Gland Entry M32 <i>(Ex 50 & Ex 40 only)</i>	
	R40	Reduced Cable Gland Entry M40 <i>(Ex 63 & Ex 50 only)</i>	
	R50	Reduced Cable Gland Entry M50 <i>(Ex 63 only)</i>	
CERTIFICATION	A	ATEX/IECEx	A
	G	GOST	
	N	NEC 505	
AMBIENT RATING AND TEMPERATURE CLASS	1	T5 +40°C Standard	1
<i>T5 +40°C will be supplied as standard if alternative not specified.</i>	2	T5 +50°C	
	3	T5 +60°C	
	4	T6 +40°C	
	5	T6 +50°C	
	6	T6 +60°C	
TERMINATION [♦]	T	Termination Required	T

[♦] If not required, omit selection character from order code.



The flameproof cap must be fitted to the connector before the power is restored to the disconnected circuit. The receptacle cap and plug cap are available in acetal and provide an IP rating of IP66/67. They may only be used when the socket or plug is not re-energised following disconnection. For connector plugs and connector receptacles cable glands are required to terminate incoming cables. Hawke recommend the ICG 653/UNIV cable gland is used.

HAWKE Ex SERIES DIMENSIONS (MM)

Dimension	Ex16	Ex25	Ex32	Ex40	Ex50	Ex63
A	127	152	152	152	152	148
B	105	128	129	129	129	126
Ø C	36	46	53	60	66	83
Ø D	37	49	57	65	76	90
E	128	152	152	152	152	152
Ø F	32	45	51	59	70	83
G	15	15	15	15	15	15
H (nominal)	20	20	20	20	20	20
J (Aperture Clearance Hole)	55	65	75	85	95	115
*Thread L (1.5mm Pitch)	M25	M32	M40	M50	M63	M75
M	54	54	56	56	56	56
N A/F	36	46	55	65	80	95
R	15	15	15	16	16	17
S	38	38	38	39	39	40
Ø T	28	34	42	51	60	73
U	40	40	40	40	40	40
Thread V (1.5mm Pitch)	M20	M25	M32	M40	M50	M63
X (nominal)	54	70	70	70	70	67
Ø Y	66	76	83	91	102	117
△	49	59	66	74	85	100
Ø Z	87	99	105	117	129	147
□	70	82	88	100	112	130

*Bulkhead entry thread L can be adapted to other sizes. This may affect the overall length of unit.

Hazardous Area Connectors

Certified ATEX / IECEx / GOST / NEC 505

Control Calculations

To select the shell size of the connector, it is essential that you calculate the dissipated wattage of the arrangement. This ensures that the arrangement does not exceed the maximum permitted temperature classification with regard to the upper ambient temperature for the area of installation. (please refer to table 1 for the maximum allowable dissipated wattage per connector size).

Connector Size	Upper ambient Temperature of +40°C		Upper ambient Temperature of +50°C		Upper ambient Temperature of +60°C	
	Temperature Class		Temperature Class		Temperature Class	
	T6	T5	T6	T5	T6	T5
Ex16	5W	7W	4W	6W	2.6W	4.6W
Ex25	8W	11W	6W	10W	4W	7W
Ex32	10.5W	14.5W	8W	12W	5.4W	9W
Ex40	12W	17W	9W	14W	5.5W	10.5W
Ex50	13W	20W	10W	17W	6.5W	12.5W
Ex63	17W	29W	13W	24W	8.5W	17W
	Maximum allowable dissipated wattage					

Other ambient temperature options can be extrapolated from Table 1 above, or contact Hawke International for more information.

Contact Size	Combined Cable and Contact Resistance (Ohms)		Contact Current Rating
	Soldered	Crimped	
1.5mm ²	0.0166 Ω	0.0173 Ω	10 amps
2.5mm ²	0.0102 Ω	0.0109 Ω	17 amps
6mm ²	0.0047 Ω	0.0054 Ω	30 amps
10mm ²	0.0027 Ω	0.0033 Ω	78 amps
16mm ²	0.0018 Ω	0.0024 Ω	78 amps
25mm ²	0.0012 Ω	0.0018 Ω	125 amps
35mm ²	0.0009 Ω	0.0015 Ω	125 amps

Dissipated wattage calculation

Equation Definitions

- W = Dissipated wattage factor of the connector
- N = The number of conductors to be terminated/number of contacts required.
(Note: A contact comprises of a pin and socket).
- I = The current requirement per contact.
(Note: This must be equal to or less than the maximum current rating of the contact, as shown in table 2).
- R = The combined cable and contact resistance (see table 2)

Values pertinent to these definitions must then be input into the following equation to calculate the dissipated wattage (w) of your chosen arrangement:

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

(Note: The results must be lower than the maximum figure shown in table 1 for the appropriate temperature class and ambient temperature).

e.g. T6 40°C ambient application with 9 x 1.5mm² conductors, running at 7 amps.

$$N = 9 \text{ contacts} \quad I = 7 \text{ amps} \quad R = 0.0166\Omega \quad (1.5\text{mm}^2 \text{ soldered combined cable and contact resistance})$$

Therefore $W = 9 \times 49 \times 0.0166\Omega = 7.32 \text{ watts}$.

Therefore, an Ex25 Connector should be specified for this application as the shell size can accommodate the required 9 x 1.5mm² pin/socket inserts (SEE PAGE 56 - Insert Selection Table) and the resultant dissipated wattage (7.32 watts) is below the maximum permitted 8 watts (See Table 1).

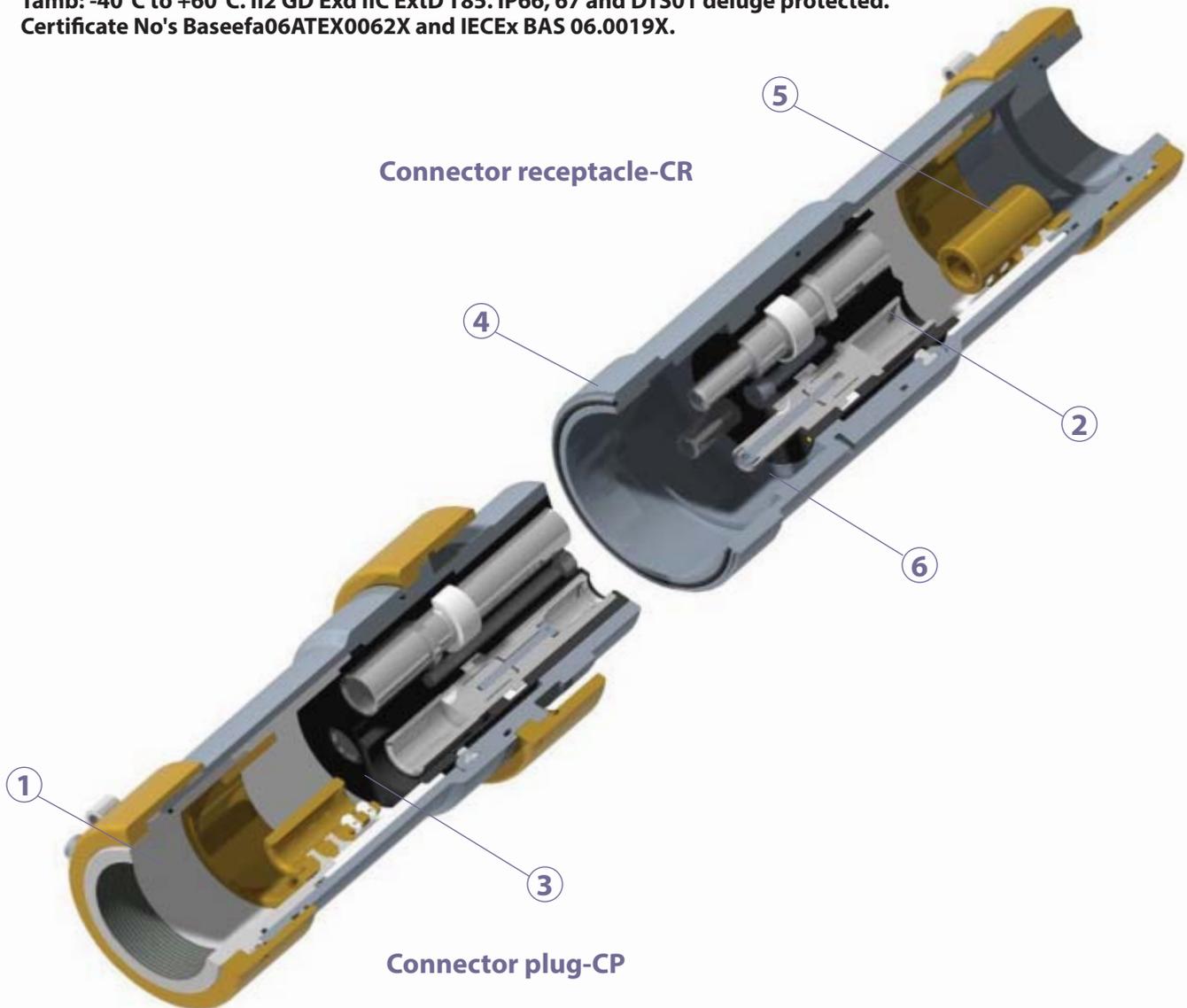
This equation can also be transposed to facilitate the calculation of the maximum number of conductors permitted in your selected connector ① and the maximum allowable current within the upper ambient temperature of our location ②.

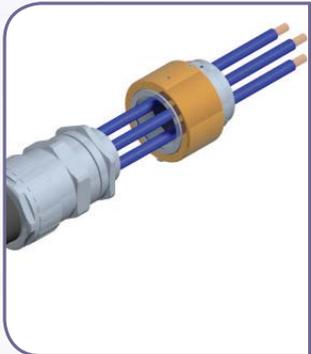
$$\textcircled{1} \quad N = \frac{W}{R \times I^2} \qquad \textcircled{2} \quad I = \sqrt{\frac{W}{N \times R}}$$

(Note: The result of equation ② must not exceed the maximum current rating of contacts (see table 2).

Note: Unless otherwise requested, connectors will be marked as T5 with an upper ambient temperature of +40°C.

Tamb: -40°C to +60°C. II2 GD Exd IIC ExtD T85. IP66, 67 and DTS01 deluge protected.
Certificate No's Baseefa06ATEX0062X and IECEx BAS 06.0019X.





1

Running coupler
Allows the connector to be installed onto a pre-assembled cable gland.



4

Acme thread at mating interface
Unique ACME thread offers a smooth and quick fully mating action.



2

Easy fieldwireable
Insert assembled outside connector shell to assist wiring and allow greater flexibility.



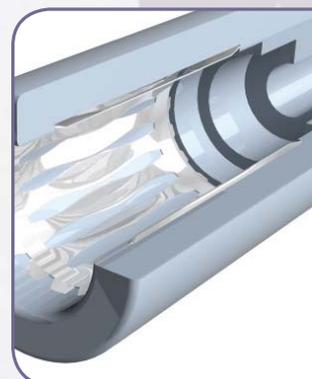
5

Internal earth
Internal earth fitted as standard. Size to suit cables earthing facility.



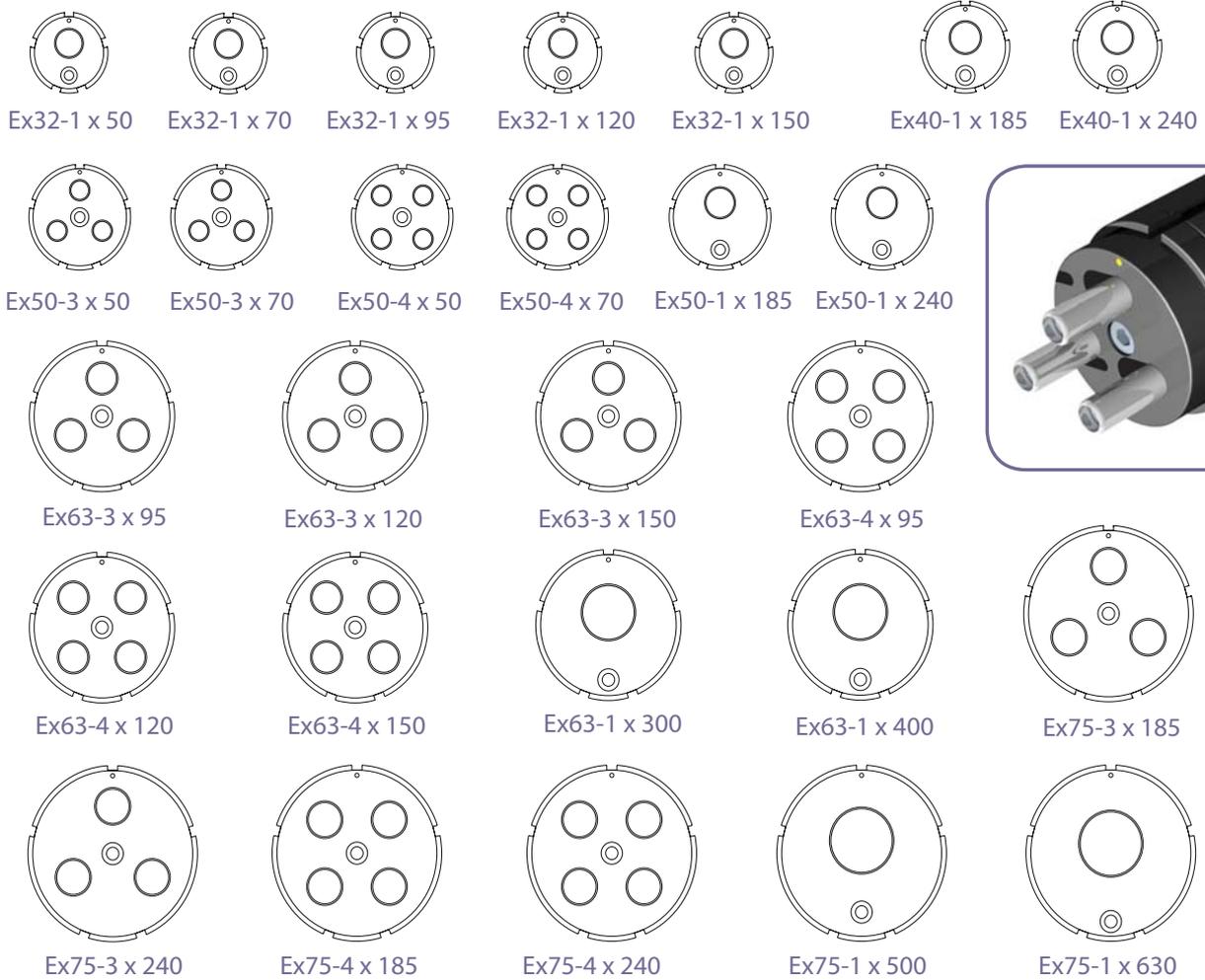
3

Keying position
The unique visual 5 position insert keying system along with the integral machined keyway prevents contact damage and ensures safe use by eliminating the possibility of misconnection of adjacent circuits.



6

Multilam technology
Tried and tested multiple high contact force, low resistance multilams used in all contacts.



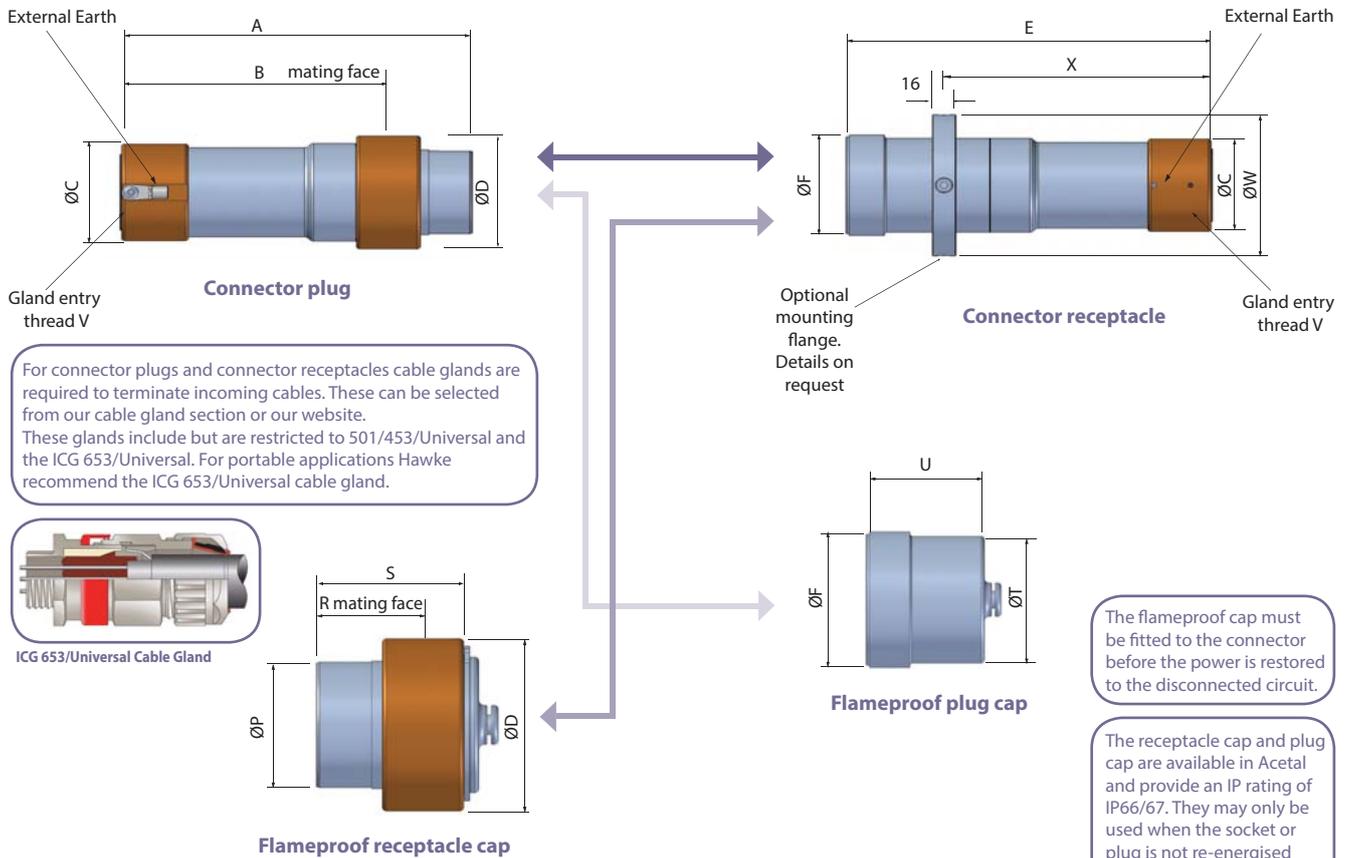
HAWKE Ex SERIES DIMENSIONS (MM)

Configuration				
Shell Size 32	Shell Size 40	Shell Size 50	Shell Size 63	Shell Size 75
1 x 50mm ² + Earth	1 x 185mm ² + Earth	3 x 50mm ² + Earth	3 x 95mm ² + Earth	3 x 185mm ² + Earth
1 x 70mm ² + Earth	1 x 240mm ² + Earth	3 x 70mm ² + Earth	3 x 120mm ² + Earth	3 x 240mm ² + Earth
1 x 95mm ² + Earth	-	4 x 50mm ² + Earth	3 x 150mm ² + Earth	4 x 185mm ² + Earth
1 x 120mm ² + Earth	-	4 x 70mm ² + Earth	4 x 95mm ² + Earth	4 x 240mm ² + Earth
1 x 150mm ² + Earth	-	1 x 185mm ² + Earth	4 x 120mm ² + Earth	1 x 500mm ² + Earth
-	-	1 x 240mm ² + Earth	4 x 150mm ² + Earth	1 x 630mm ² + Earth
-	-	-	1 x 300mm ² + Earth	-
-	-	-	1 x 400mm ² + Earth	-

All Hawke Power  connectors have a maximum working voltage of (750V AC). Other voltages and contact configurations also available. contact Hawke International for details.

When ordering, select relevant code from each block as shown in the **example below: Power  / Exd-50-S-CR-A-4-50-S-FLFRC-A**

Power 	SELECT CODE	DESCRIPTION	EXAMPLE CODE	
PROTECTION	Exd	Flameproof	Exd	
SHELL SIZE	32	32	50	
	40	40		
	50	50		
	63	63		
	75	75		
MATERIAL	B	Brass Note: (for single core cables, Brass must be used)	S	
	S	Stainless Steel (as standard)		
	N	Nickel Plated Brass		
CONNECTOR STYLE	CP	Connector Plug	CR	
	CR	Connector Receptacle		
INTERNAL EARTH SIZE	A	50mm ²	A	
	B	70mm ²		
	C	95mm ²		
	D	120mm ²		
	E	150mm ²		
	F	185mm ²		
	G	240mm ²		
		Note: (should be at least 50% of phase conductor size)		
NUMBER OF CONTACTS		See Insert Selection Chart	4	
CONTACT TYPE		CONTACT TYPE	MAXIMUM CONDUCTOR ACCEPTANCE DIAMETER (mm)	50
	50	50mm ²	9.5	
	70	70mm ²	11.5	
	95	95mm ²	13	
	120	120mm ²	14.5	
	150	150mm ²	16.5	
	185	185mm ²	18.5	
	240	240mm ²	20.5	
	300	300mm ²	25	
	400	400mm ²	29	
	500	500mm ²	32	
	630	630mm ²	38	
	X	No Insert		
INSERT TYPE	P	Pin		S
	S	Socket		
ACCESSORIES	FL	Mounting Flange *		FLFRC
<i>* Note: only the connector receptacle (CR) can be flange mounted.</i>	FPC	Flameproof Plug Cap		
	FRC	Flameproof Receptacle Cap		
	PPC	Environmental Plug Cap		
	PRC	Environmental Receptacle Cap		
CERTIFICATION	A	ATEX/IECEX		A
	G	GOST		



HAWKE Ex SERIES DIMENSIONS (MM)

Dimension	Ex32P	Ex40P	Ex50P	Ex63P	Ex75P
A	228	228	228	228	238
B	168	168	168	168	178
ØC	60	66	76	89	101
ØD	73	79	89	102	114
E	251	251	251	251	261
ØF	67	73	82.5	95	108
ØP	48	55	65	78	90
R	60	60	60	60	60
S	75.5	75.5	75.5	75.5	76
ØT	61	68	77	90	102
U	68.5	68.5	68.5	68.5	68.5
Thread V (1.5mm Pitch)	M32*	M40*	M50*	M63*	M75*
ØW	100	106	116	129	141
X	184	184	184	184	194

*Other entry threads also available.



To select the shell size of the connector, it is essential that you calculate the dissipated wattage of the arrangement. This ensures that the arrangement does not exceed the maximum permitted temperature classification with regard to the upper ambient temperature for the area of installation.
(please refer to table 1 for the maximum allowable dissipated wattage per connector size).

TABLE 1						
Connector Size	Upper ambient Temperature of +40°C		Upper ambient Temperature of +50°C		Upper ambient Temperature of +60°C	
	Temperature Class		Temperature Class		Temperature Class	
	T6	T5	T6	T5	T6	T5
Ex32P	20.5W	27.5W	15.75W	26W	7.5W	15.75W
Ex40P	22.5W	30.5W	17.5W	28W	8.7W	17.5W
Ex50P	25.8W	35.3W	20W	32.25W	10W	20W
Ex63P	30.2W	41.5W	23.5W	37.7W	11.7W	23.5W
Ex75P	36.3W	49.5W	28.25W	45.25W	14W	28.25W
Maximum allowable dissipated wattage						
Other ambient temperature options can be extrapolated from Table 1 above, or contact Hawke International for more information.						

TABLE 2		
Contact Size	Combined Cable and contact Resistance $\mu(\text{Ohms})$	Contact Current Rating
50mm ²	514	190amps
70mm ²	387	240amps
95mm ²	283	290amps
120mm ²	239	340amps
150mm ²	202	385amps
185mm ²	170	440amps
240mm ²	144	520amps
300mm ²	82	590amps
400mm ²	67	670amps
500mm ²	54	720amps
630mm ²	45	780amps

Dissipated wattage calculation

Equation definitions

W = Dissipated wattage factor of the connector

N = The number of conductors to be terminated/number of contacts required. (Note: A contact comprises of a pin and socket).

I = The current requirement per contact.

(Note: This must be equal to or less than the maximum current rating of the contact, as shown in table 2).

R = The combined cable and contact resistance (see table 2)

Values pertinent to these definitions must then be input into the following equation to calculate the dissipated wattage (w) of your chosen arrangement:

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

(Note: The results must be lower than the maximum figure shown in table 1 for the appropriate temperature class and ambient temperature).

e.g. T6 40°C ambient application with 4 x 95mm² conductors, running at 160 amps.

N = 4 contacts I = 160 amps R = 0.000283Ω (95mm² soldered combined cable and contact resistance)

Therefore W = 4 x 25600 x 0.000283Ω = 28.9 watts.

Therefore an Ex63P Connector should be specified for this application as the shell size can accommodate the required 4 x 95mm² pin/socket inserts (SEE PAGE 62 - Insert Selection Table) and the resultant dissipated wattage (28.9 watts) is below the maximum permitted 30.2 watts (see table 1).

This equation can also be transposed to facilitate the calculation of the maximum number of conductors permitted in your selected connector ① and the maximum allowable current within the upper ambient temperature of our location ②

$$\textcircled{1} N = \frac{W}{R \times I^2}$$

$$\textcircled{2} I = \sqrt{\frac{W}{N \times R}}$$

(Note: The result of equation ② must not exceed the maximum current rating of contacts (see table 2).

Note: Unless otherwise requested, connectors will be marked as T5 with an upper ambient temperature of +40°C.

Connector selection application

State of the art, rich internet application for rapid and easy selection of connectors. All wattage calculations etc. are worked out for you. All that is required is for the user to input the cable details.

Projects can be saved and edited. Completed projects can be sent to Hawke International for quoting purposes.

Step 1

Shell and insert size selection.

Step 2

Accessories and keying system selection.

Step 3

Cable gland plus adaptor and reducer section.

Step 4

This screen displays the connector, gland and any adaptors/reducers required.

Short Circuit Testing

All contact sizes in the Hawke connector range have been short circuit tested. For further information please contact Hawke International's Technical department.

Crimp Tool

Instrum inserts and **Control** inserts up to 2.5mm² must be terminated using the Hawke HCT or HCT1 Crimping Tool.

Electronic Data on CD Rom

- Hazardous Area Connectors for Global Connection Solutions catalogue in PDF format.
- The **Instrum** , **Control** and **Power** connector presentation.

Instrum , **Control** and **Power** are registered trademarks.