

HAWKE
International

CONTROL Ex CONNECTORS

..... For Harsh & Hazardous Environments



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Introducing Hawke's **ControlEx** range of Connectors

The 4th generation of ControlEx 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 750V.

The ControlEx range of connectors is ideal for use in control and low/ medium power applications.



International Approvals

Connector Plug - CP




Bulkhead - BR

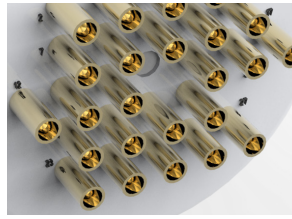


Connector Receptacle - CR



Tamb: -40°C to +60°C  II 2 GD Exdb IIC Gb, Extb IIIC Db T95
IP66, 67 & DTS01 deluge protected
Certificate No's Baseefa12ATEX0014X & IECEx BAS 12.0006X.

CONTROLEX



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



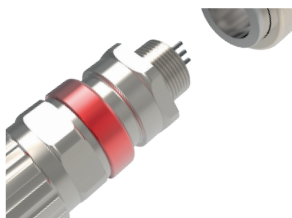
2 Internal Keyway Spacer - Eases accessibility for termination as tube fitted after termination complete, along with allowing easy installation into the required keyed position (See 4)



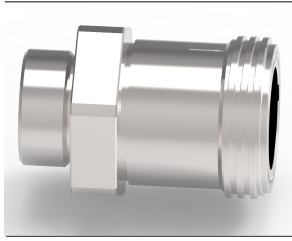
3 Locking Pin - Optional locking pin provides the facility for mated connectors to be permanently locked, via the use of a padlock, ensuring they cannot be separated under load. *(Padlock not supplied)*



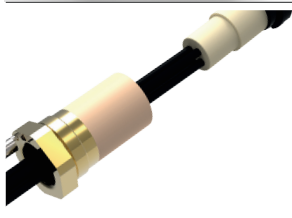
4 Keying Position -The unique visual 5 position insert keying system (3 on Ex16) along with the integral machined keyways prevent contact damage and ensures safe use by eliminating the possibility of misconnection of adjacent circuits.



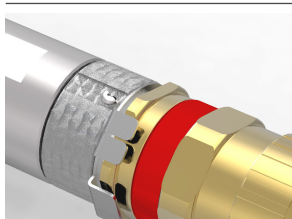
5 Running Coupler - Allows the connector to be installed onto a pre-assembled cable gland. Connector is rear loading and includes locking engaging nut.



6 Acme Thread at Mating Interface - Unique ACME thread offers a smooth and quick fully mating action.



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.



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.

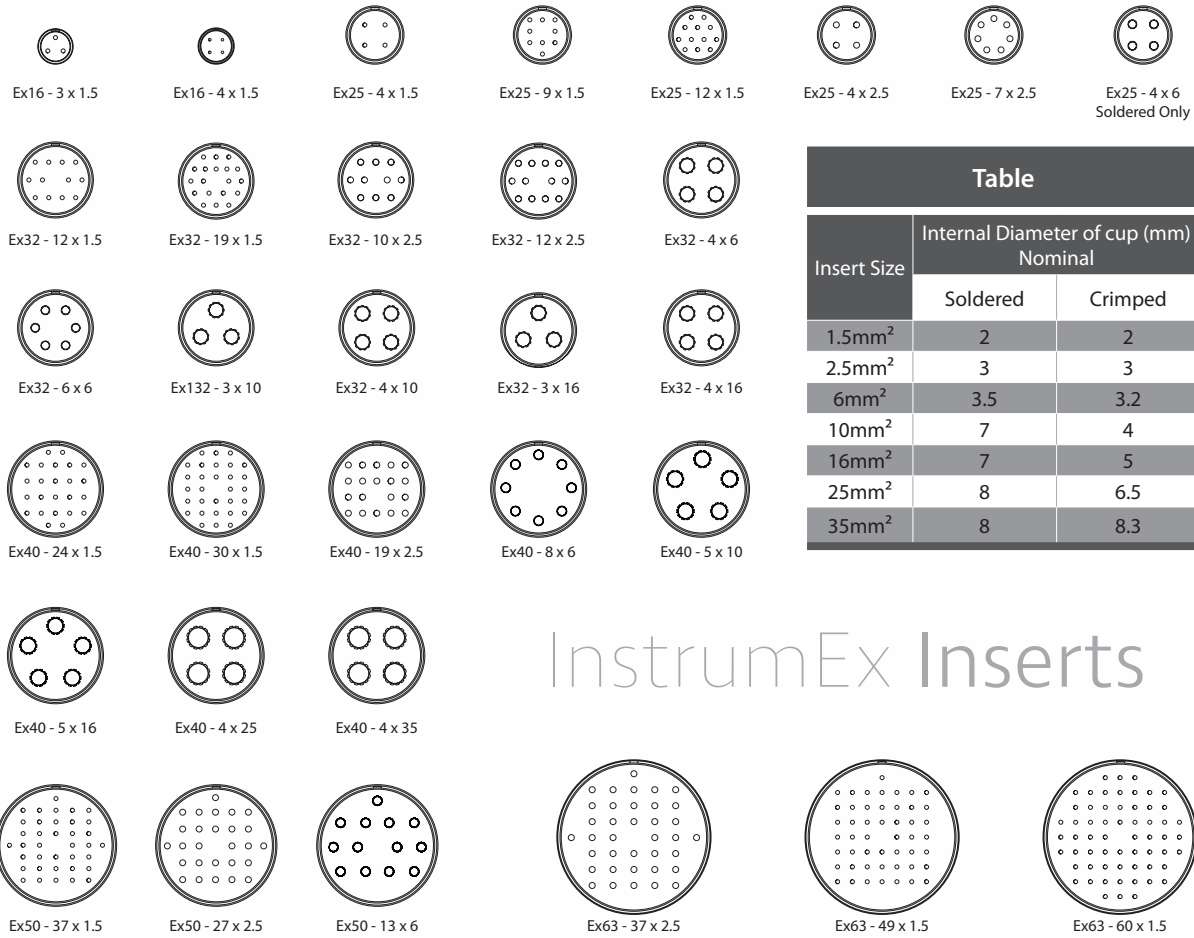


Table		
Insert Size	Internal Diameter of cup (mm) Nominal	
	Soldered	Crimped
1.5mm ²	2	2
2.5mm ²	3	3
6mm ²	3.5	3.2
10mm ²	7	4
16mm ²	7	5
25mm ²	8	6.5
35mm ²	8	8.3

InstrumEx Inserts

Working Voltage Information

Hawke **ControlEx** Connectors have a maximum working voltage of 660V DC (660V AC) as standard. 3rd & 4th generation **ControlEx** Connectors can be connected together within certification. Other voltages available on special request.

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			

Connectors Order Codes

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

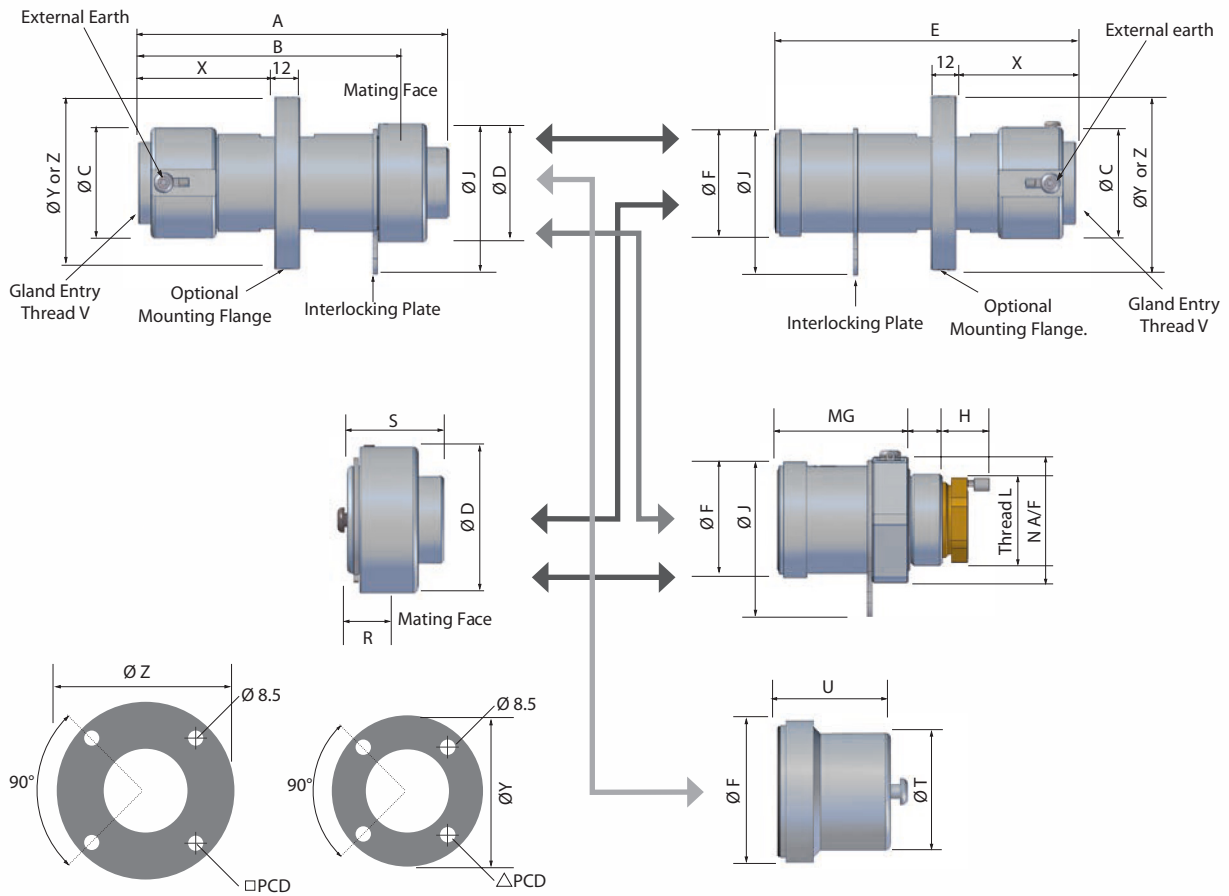
Order Codes			
ControlEx Connector			
	SELECT CODE	DESCRIPTION	Example Code
Protection Concept	Exd	Flameproof	Exd
SHELL SIZE	16	Ex16 Shell Size	32
	25	Ex25 Shell Size	
	32	Ex32 Shell Size	
	40	Ex40 Shell Size	
	50	Ex50 Shell Size	
	63	Ex63 Shell Size	
MATERIAL	S	Stainless Steel	S
CONNECTOR STYLE	CP	Connector Plug	CP
	CR	Connector Receptacle	
	BR	Bulkhead Receptacle	
KEYING SYSTEM	V	Variable Keyway	V
NUMBER OF CONTACTS		See Insert Selection Chart	19
	X	No Insert	
CONTACT SIZE		See Insert Selection Chart	1.5
	X	No Insert	
INSERT TYPE	P	Pin	S
	S	Socket	
	X	No Insert	
TERMINATION STYLE (BR is always solder for 6mm ² contacts and above)	S	Solder	C
	C	Crimp	
	X	No Insert	
FLANGE TYPE*	FL	Mounting Flange	FL
	SF	Split Flange	
CAP TYPE	FRC	Flameproof Receptacle Cap	FPC
	FPC	Flameproof Plug Cap	
	PRC	Plastic Receptacle Cap	
	PPC	Plastic Plug Cap	
LOCKING PIN*	P	Locking Pin	P
CABLE GLAND REDUCED ENTRY*	R20	Reduced Cable Gland Entry M20* (Ex 25 only)	R25
	R25	Reduced Cable Gland Entry M25 (Ex 40 & Ex 32 only)	
	R32	Reduced Cable Gland Entry M32 (Ex 50 & Ex 40 only)	
	R40	Reduced Cable Gland Entry M40 (Ex 63 & Ex 50 only)	
	R50	Reduced Cable Gland Entry M50 (Ex 63 only)	
CERTIFICATION	A	ATEX/IECEX/EAC/INMETRO/UKEx	A
	N	ATEX/IECEX/UKEx/EAC/INMETRO/cCSAus Voltage reduced to 600V	
AMBIENT RATING AND TEMPERATURE CLASS	1	T5 + 40 °C Standard	1
	2	T5 + 50°C	
	3	T5 + 60°C	
	4	T5 + 40°C	
	5	T6 + 50°C	
	6	T6 + 60°C	

Select relevant code from each block as shown in the following example: **ControlEx / Exd-32-S-CP-V-19 x 1.5-S-C-FL-FPC-P-R25-A-1-T**

* May be omitted if not required



Dimensions & Technical Specifications



HAWKE Ex SERIES DIMENSIONS (MM)

ControlEx						
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
Δ	49	59	66	74	85	100
Ø Z	87	99	105	117	129	147
□	70	82	88	100	112	130

Dissipated Wattage Calculation

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 contacts I = 7 amps R = 0.0166Ω (1.5mm² soldered combined cable and contact resistance)

Therefore **W = 9 x 49 x 0.0166Ω = 7.32 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 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.

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

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.

Testing Data

Maximum allowable dissipated wattage						
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

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

Hawke Connectors Range

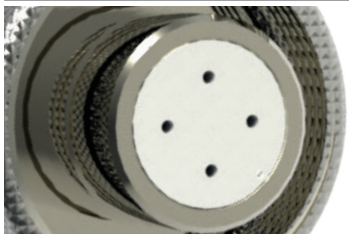
Utilising the most advanced technology, Hawke connectors are designed for quick and easy termination. Boasting market-leading features like the complete elimination of cross-mating, high reliability contacts and much more, the Hawke Connector range guarantees innovation, safety and reliability. The range is ideal for use in dust and gas hazardous areas commonly found in Oil and Gas exploration and production and chemical process plants. Hawke connectors may also be used in explosive dust environments and hostile non-explosive environments.

The Hawke Connector range has been designed for four electrical application areas: Instrumentation, Control, Power and Fibre. Take a closer look at our range, below.



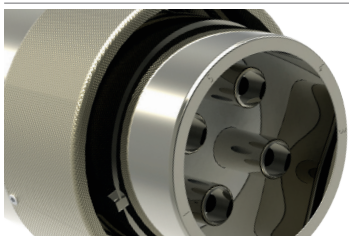
Instrum

The revolutionary InstrumEx allows for the live mate and de-mating of signal and low power in hazardous areas safely and quickly.



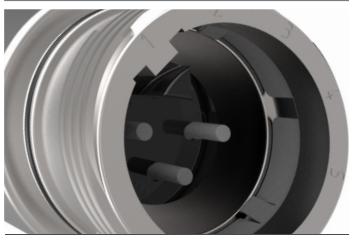
Control

The ControlEx range is ideal for use in control and low/ medium power applications.



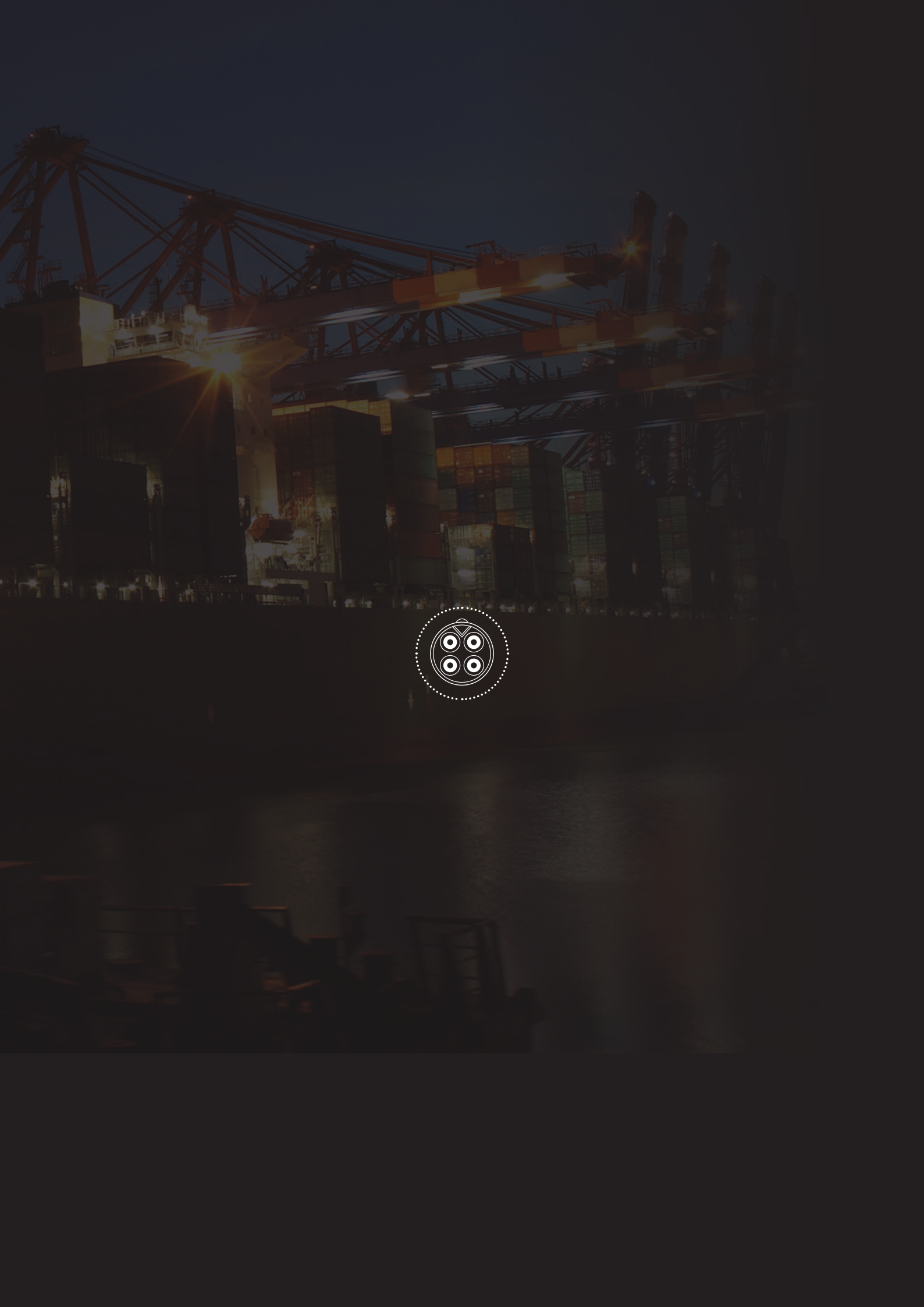
Power

The PowerEx range has been designed specifically for the extremely demanding requirements of higher power applications up to 780A and 750V as standard. Other voltages are available on special request.



Fibre

The Fibre Ex from Hawke and Acal BFi combines the strength of Hawke's market-leading connection range with the latest in Ex Fibre-Optic specifications.



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