



## TYPE: SHK-D



# SHK-D 'D' Type Crosby™ Cabled Load Shackle

## Description

The LCM range of load shackles is designed for lifting and weighing in rugged or harsh environments. The shackle pins are manufactured to an exacting specification and are machined from high tensile stainless steel to 6.5te and forged from high tensile carbon steel from 9.5te. The basic shackle uses the Crosby G2150 series.

This range of loads cells is proof loaded to 150% of the normal rated load, and is available in a range from 1 tonne to 35 tonne. The SHK-D is internally gauged and the whole instrumented area is sealed to IP67 to protect it in service.

They are simple to install and are available in standard shackle sizes. As an option, a rotating bobbin can be supplied to centralise the load and to minimise any point-load effects when the shackle is placed under load. We are also always happy to discuss any special requirements that can be accommodated.

The SHK-D series can be supplied on its own or combined with our extensive range of instrumentation to provide a complete load monitoring package.

## Specification

Rated load (tonnes)	1, 2, 3.25, 4.75, 6.5, 9.5, 12, 17, 25, 35	
Proof load	150% of rated load	
Ultimate breaking load	300% of rated load	
Output	Between 1.8mV and 2.4mV	
Non-linearity	<±1% of rated load (typically)	
Non-repeatability	<±0.1% of rated load	
Excitation voltage	10vdc recommended, 15vdc maximum	
Bridge resistance	350Ω	
Insulation resistance	>500MΩ @ 500vdc	
Operating temperature range	-20 to +70°C (-20 to +55°C for Ex d)	
Compensated temperature range	-10 to +50°C	
Zero temperature coefficient	<±0.01% of rated load/°C	
Span temperature coefficient	<±0.01% of rated load/°C	
ATEX certification details	Ex i	II 2G Ex ib IIC T4 Gb / II 2D Ex ib IIIC T135°C Db
	Ex d	II 2G Ex d IIC T6 Gb / II 2D Ex tb IIIC T85°C Db
Environmental protection level	IP67	
Connection type	10 metre 4 core screened PUR cable (glanded exit)	
Wiring connections	+ve supply: Red	-ve supply: Blue
	+ve signal: Green	-ve signal: Yellow

## Available Options

- Special ranges and capacities up to 2000te
- Hazardous Area certified - Explosion Proof (Ex d) and Intrinsically Safe (Ex i)
- Special electrical connections
- Integral signal conditioning
- Centralising load bobbin
- Subsea and offshore versions
- Lloyds, ABS or DNV witness testing

## Features

- Ranges from 1 tonne to 35 tonne
- Environmentally sealed to IP67
- Simple installation and operation
- Shackle and load pin fully certified
- Optional load centralising bobbin
- Can be supplied with integral signal conditioning
- Hazardous Area certified from 3.25 tonnes
- Many other options available

## Typical Applications

- Under-hook hoist/crane weighing
- Cable tension monitoring
- Towing/Mooring Tension
- Crane safe load monitoring



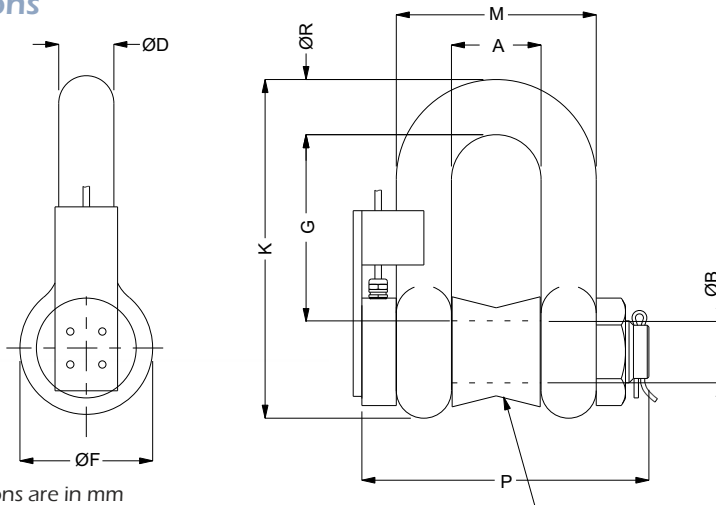
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## Special Options

Special ranges	The SHK-D can be supplied in any range, between 1te and 35te and calibrated as required. Usually we will choose the nearest standard shackle size. We can also offer special design shackles up to 2000te.
Special electrical	The standard SHK-D cable exits the shackle pin via a gland and its connections restrained using the anti-rotation bracket. We can offer variations to the electrical connection method. For example, integral connectors, special cable length etc.
Integral signal conditioning	We can offer various integral signal conditioning options: <b>Analogue Signals</b> 4-20mA 2-wire current output (7.5 to 28vdc supply) For ATEX versions see note 4 & 5 4-20mA 3-wire current output (13 to 28vdc supply) For ATEX versions see note 4 0.1-5.1vdc 3-wire voltage output (8.5 to 28vdc supply) For ATEX versions see note 4 0.1-10.1vdc 3-wire voltage output (13 to 28vdc supply) For ATEX versions see note 4 <b>Digital Signals</b> RS232 digital - various protocols (5.4 to 18vdc supply) For ATEX versions see note 4 RS485 digital - various protocols (5.4 to 18vdc supply) For ATEX versions see note 4
Centralising bobbin	We can offer an optional centralising bobbin. This helps improve the overall accuracy in certain cable tension applications. The bobbin is shown pictorially in the drawing below.
Subsea or offshore	We are able to offer fully submersible versions, which are normally supplied with underwater mateable connectors. These versions can also be pressure tested by LCM and witnessed by a third party at any point through the manufacturing process. We regularly have ABS, Lloyds or DNV inspectors on site.
Telemetry	We have a version available that uses radio telemetry to transmit data. There is a separate data sheet for this product (TELSHACK-D).
Hazardous Area	We can supply ATEX/IECEx certified load shackles for use in Zone 1 and Zone 2 hazardous areas.



## Dimensions



All dimensions are in mm

Centralising Bobbin (optional)

Model	Rated Load (tonnes)	A	ØB	ØD	ØF	G	K	M	P	ØR	Weight (kgs)	Resolution (tonnes)
SHK-D-1	1	16.8	11.2	9.65	23.1	31	58.5	35.8	55	9.65	2	0.001
SHK-D-2	2	20.6	16	12.7	30.2	41.4	77	46	84	12.7	2.2	0.002
SHK-D-3.25	3¼	26.9	19.1	16	38.1	51	95.5	58.5	89.5	16	2.4	0.005
SHK-D-4.75	4¾	31.8	22.4	19.1	46	60.5	115	70	103	20.6	2.8	0.005
SHK-D-6.5	6½	36.6	25.4	22.4	53	71.5	135	81	120	24.6	3.5	0.005
SHK-D-9.5	9½	46.0	31.8	28.7	68.5	91	172	103	150	31.8	6	0.01
SHK-D-12	12	51.5	35.1	31.8	76	100	191	115	165	35.1	8	0.01
SHK-D-17	17	60.5	41.4	38.1	92	122	230	137	196	41.1	10	0.02
SHK-D-25	25	73.0	51	44.5	106	146	279	162	230	54	15	0.02
SHK-D-35	35	82.5	57	51	122	172	312	184	264	60	22	0.05

Note 1: Our ATEX range starts at 3.25 tonnes.

Note 2: Part numbers for ATEX versions will be suffixed with either -ATEX-D (explosion proof) or -ATEX-I (intrinsically safe) e.g. SHK-D-35-ATEX-D.

Note 3: Dimensions may change for hazardous area versions.

Note 4: Maximum supply voltage for Ex d versions is 27Vdc.

Note 5: Supply voltage for Ex I versions is 9-28vdc (only 2-wire 4-20mA is available with Ex I versions)

www.lcmsystems.com

LCM Systems Ltd

Unit 15, Newport Business Park, Barry Way  
Newport, Isle of Wight PO30 5GY UK

Tel: +44 (0) 1983 249264

sales@lcm systems.com

www.lcm systems.com

Due to continual product development, LCM Systems Ltd reserves the right to alter product specifications without prior notice.

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