

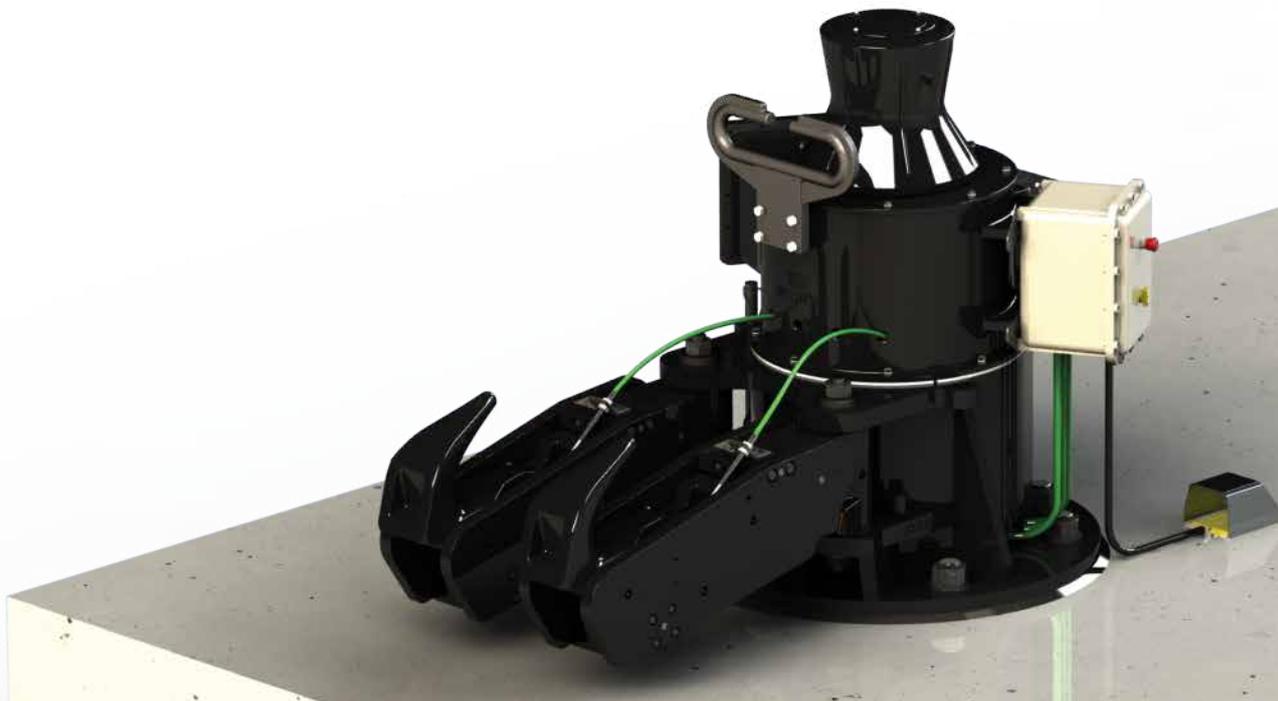


SmartMoor Series II

SmartMoor Series II Quick Release Hooks

Quick Release Hook (QRH) units are available with single or multiple hooks in capacities from 30t to 200t. Each hook cantilevers from the mounting base and the design ensures the hook cannot impact the deck under any loading configuration. The QRH is designed to be released by an operator when a mooring line is attached, even under full load.

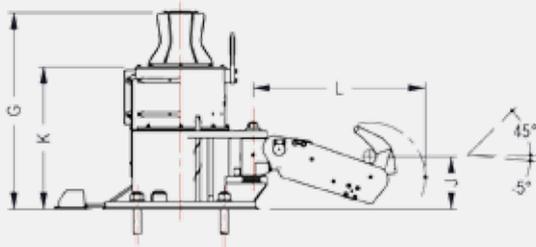
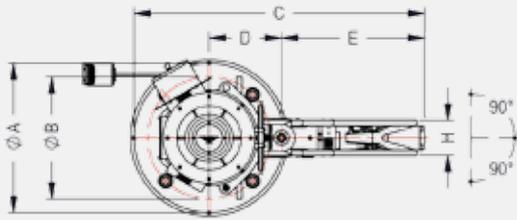
Field proven since 1972 and installed in over 600 mooring facilities worldwide, Trelleborg's quick release hooks are the foundation for today's modern mooring systems.



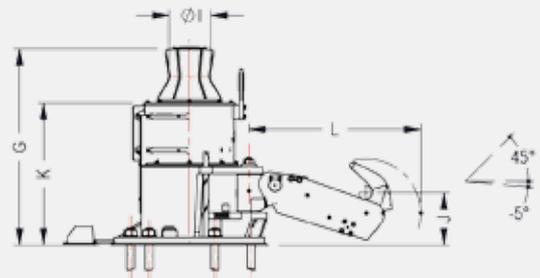
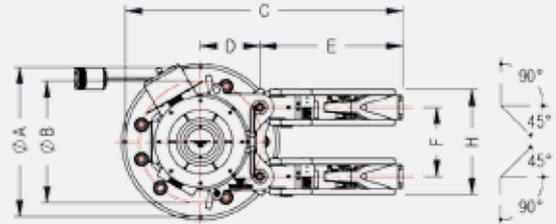
Trelleborg Marine Systems' commitment to continuous product improvement means that we reserve the right to upgrade and modify equipment and systems without notice as technological and operational parameters demand.

SmartMoor Series II Models

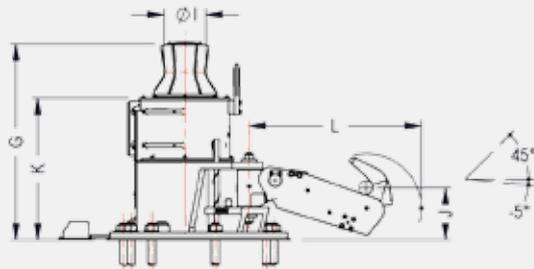
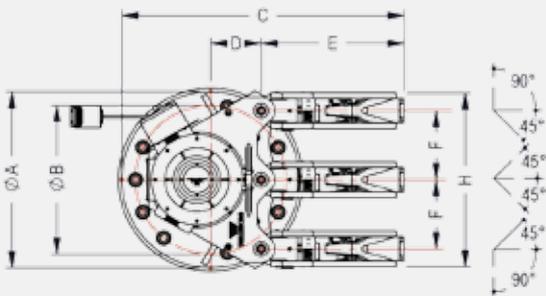
Single Hook



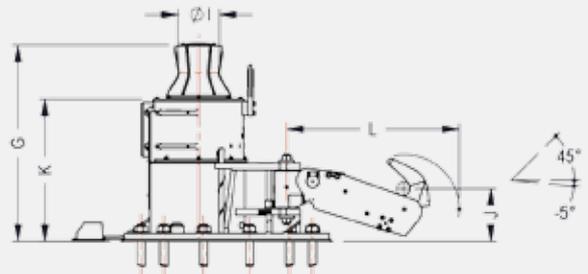
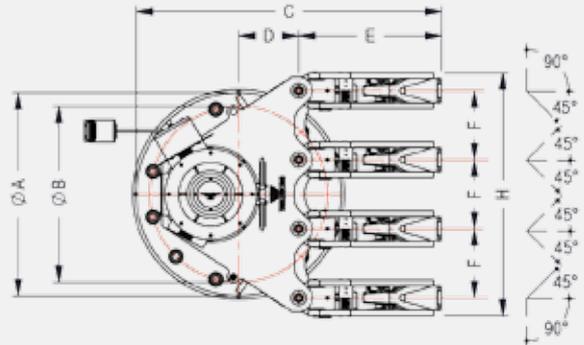
Double Hook



Triple Hook



Quadruple Hook



SmartMoor Series II Model Numbers & Dimensions

MODEL NUMBER	QTY QRH	A	B	C	D	E	F	G	H	I	J	K	L	HD BOLT QTY	SHIPPING MASS Kg
CP45 (Safe Working Load = 45 tonnes)															
CP45-01	Single	1100	900	2016	530	936	-	1445	246	305	380	1045	1140	4	1450
CP45-02	Double	1100	900	1921	435	936	510	1445	756	305	380	1045	1140	5	1500
CP45-03	Triple	1300	1100	1956	370	936	510	1445	1266	305	380	1045	1140	6	2130
CP45-04	Quad.	1500	1300	2126	430	936	510	1445	1776	305	380	1045	1140	10	2870
CP60 (Safe Working Load = 60 tonnes)															
CP60-01	Single	1100	900	2016	530	936	-	1445	246	305	380	1045	1140	4	1450
CP60-02	Double	1100	900	1921	435	936	510	1445	756	305	380	1045	1140	5	1500
CP60-03	Triple	1300	1100	1956	370	936	510	1445	1266	305	380	1045	1140	8	2130
CP60-04	Quad.	1500	1300	2126	430	936	510	1445	1776	305	380	1045	1140	10	2870
CP75 (Safe Working Load = 75 tonnes)															
CP75-01	Single	1100	900	2016	530	936	-	1445	246	305	380	1045	1140	4	1450
CP75-02	Double	1100	900	1921	435	936	510	1445	756	305	380	1045	1140	5	1500
CP75-03	Triple	1300	1100	1956	370	936	510	1445	1266	305	380	1045	1140	8	2130
CP75-04	Quad.	1500	1300	2126	430	936	510	1445	1776	305	380	1045	1140	10	2870
CP100 (Safe Working Load = 100 tonnes)															
CP100-01	Single	1100	900	2127	530	1047	-	1445	262	305	385	1045	1260	4	1530
CP100-02	Double	1100	900	2032	435	1047	510	1445	772	305	385	1045	1260	7	1600
CP100-03	Triple	1300	1100	2067	370	1047	510	1445	1282	305	385	1045	1260	10	2280
CP100-04	Quad.	1500	1300	2237	440	1047	510	1445	1792	305	385	1045	1260	14	3070
CP125 (Safe Working Load = 125 tonnes)															
CP125-01	Single	1100	900	2126	530	1046	-	1445	262	305	385	1045	1260	7	1700
CP125-02	Double	1200	1000	2081	435	1046	510	1445	772	305	385	1045	1260	11	1840
CP125-03	Triple	1300	1100	2066	370	1046	510	1445	1282	305	385	1045	1260	14	2460
CP125-04	Quad.	1650	1450	2324	440	1046	510	1445	1792	305	385	1045	1260	14	3370
CP150R (Safe Working Load = 150 tonnes)															
CP150R-01	Single	1100	900	2126	530	1046	-	1445	262	305	385	1045	1260	7	1700
CP150R-02	Double	1200	1000	2081	435	1046	510	1445	772	305	385	1045	1260	11	1840
CP150R-03	Triple	1300	1100	2066	370	1046	510	1445	1282	305	385	1045	1260	14	2460
CP150R-04	Quad.	1650	1450	2324	440	1046	510	1445	1792	305	385	1045	1260	14	3370
CP200 (Safe Working Load = 200 tonnes)															
Dimensions available upon request															

Note 1: Dimensions are in mm.

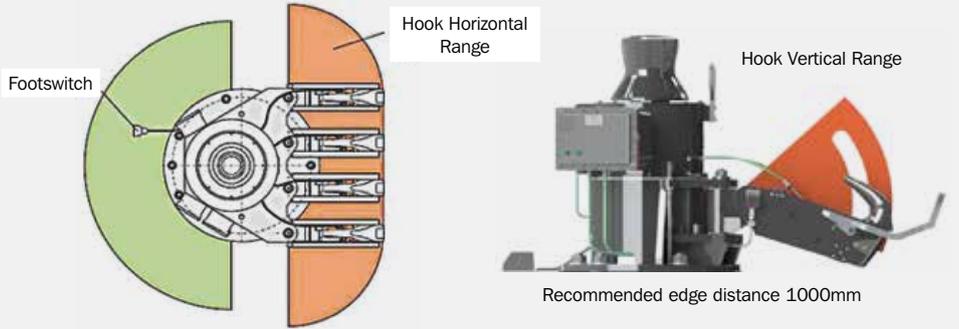
Note 2: Dimensions are typical. Always request a certified hook/base drawing before starting construction.

Note 3: Customised bases to suit bolt patterns are available upon request.

Note 4: Shipping Mass includes base, capstan, hold down bolts and packing. Mass is for indication only.

SmartMoor Series II - Specifications

1 QRH GENERAL SPECIFICATIONS - STANDARD MODELS (For variances to standard product refer to Options and Upgrades)

1.1	QRH Operational Range																										
QRH HORIZONTAL RANGE (MOUNTED ON BASE)																											
<table border="1"> <thead> <tr> <th></th> <th>HOOK 1</th> <th>HOOK 2</th> <th>HOOK 3</th> <th>HOOK 4</th> </tr> </thead> <tbody> <tr> <td>Single</td> <td>-90° to + 90°</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Double</td> <td>-90° to + 45°</td> <td>-45° to + 90°</td> <td></td> <td></td> </tr> <tr> <td>Triple</td> <td>-90° to + 45°</td> <td>-45° to + 45°</td> <td>-45° to + 90°</td> <td></td> </tr> <tr> <td>Quad</td> <td>-90° to + 45°</td> <td>-45° to + 45°</td> <td>-45° to + 45°</td> <td>-45° to + 90°</td> </tr> </tbody> </table>				HOOK 1	HOOK 2	HOOK 3	HOOK 4	Single	-90° to + 90°				Double	-90° to + 45°	-45° to + 90°			Triple	-90° to + 45°	-45° to + 45°	-45° to + 90°		Quad	-90° to + 45°	-45° to + 45°	-45° to + 45°	-45° to + 90°
	HOOK 1	HOOK 2	HOOK 3	HOOK 4																							
Single	-90° to + 90°																										
Double	-90° to + 45°	-45° to + 90°																									
Triple	-90° to + 45°	-45° to + 45°	-45° to + 90°																								
Quad	-90° to + 45°	-45° to + 45°	-45° to + 45°	-45° to + 90°																							
QRH Vertical Range (mounted on base) – All Series																											
All Bases -5° to + 45°																											
1.2	Base Capacity	Hook SWL multiplied by the number of hooks. E.g. double hook of 75 tonne SWL = 150 tonne; triple hook = 225 tonne																									
1.3	Standard Hook Base Construction	Spheroidal graphite cast iron, ASTM A536 65-45- 12 equivalent to 400-12 to AS1831 (standard cast hook base).																									
1.4	Temperature Range	Operating: -15°C to +60°C Storage: -40°C to +70°C (-40°F to 158°F) (Models with a lower minimum temperature are available. Consult our engineers)																									
1.5	Foundation Design Requirements	Designed in accordance with AS 4100 and AS3990. Suitable for concrete (recessed or surface mount) or steel foundations.																									
1.6	Hold Down Bolts (anchors)	Supplied with base as standard. Hold down bolts: M56 x 1000, BS4190 equivalent to ISO898. Property Class 8.8 Finish: Hot-dip galvanising to ISO 10684:2004 (E)																									
1.7	Anchor Template	One mild steel template supplied per base design.																									
1.8	Fasteners	Where possible all fasteners used in the assembly of quick release hooks are 316 stainless steel. Non-stainless steel fasteners are high strength Property Class 8.8 alloy steel.																									
1.9	Removable Release Lever	One per QRH unit hook included as standard.																									

Note: remote release and load monitoring details are covered in separate datasheets.

SmartMoor Series II - Specifications

1 QRH GENERAL SPECIFICATIONS - STANDARD MODELS (For variances to standard product refer to Options and Upgrades)

1.10	Hook Construction	Frame (side plates): Carbon Steel ASTM A572 Grade 50 equivalent to AS 3678 Grade 350, .
		Hook body, main pivot block, primary release block: cross shaft are high strength alloy steel to ASTM A148, equivalent to AS 2074.
		Vertical Pin: high tensile alloy steel grade SAE4140. Loadcells + dummy pins ASTM A276 431 equivalent to AS 2837 431.
1.11	Spark Prevention	The hook assembly is fitted with three elastomeric impact blocks for energy absorption. Material: polypropelene.
1.12	QRH Line Sizes (Ø mm)	Series 45/60/75 Series 100/125/150R Series 200
		Max 100 Max 110 Max 130
		One line per hook is recommended for hooks with Load Monitoring

2 QUALITY AND TESTING

2.1	NDT	ASTM E1444-05
2.2	Welding	ASTM D1.1 or AS 1554
2.3	Testing	All hooks are individually load tested using NATA (National Association of Testing Authorities [Australian]) calibrated testing equipment.
		Each QRH standard Proof Load = 125% (150% available). Each QRH is individually load tested to Proof Load and manually released at the rated Standard Working Load (SWL).
2.4	Class Design Approval	Consult our engineers if required.

3 QRH & HOOK BASE SURFACE TREATMENT

3.1	Surface Treatment	Surface Preparation –Class 2.5 Blast(1) 1st Coat: 60-80 µm DFT epoxy zinc-rich primer 2nd Coat: 160-280 µm DFT two-part epoxy, containing MIO 3rd Coat: nominal 60-80 µm re-coatable two-part polyurethane. Colour: gloss black other colours be requested. (1) AS1627.4 , USA, National Association Corrosion Engineers, NACE or Society for Protective Coatings, SSPC-SP10 Sweden, Sa 2-1/2)
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4 QRH BASE AND QRH UPGRADES

4.1	Fabricated Hook Base	Fabricated steel support structures to ASTM A572 Grade 50 equivalent to AS 3678 Grade 350. Note: Model Numbers will begin with FB.
4.2	Extended Temperature Range	Below -15°C and above +60°C. Consult our engineers if required.
4.3	Electrical Insulation	Isolates each hook from jetty structure (Material: fibre reinforced composite).

Capstan - Specifications

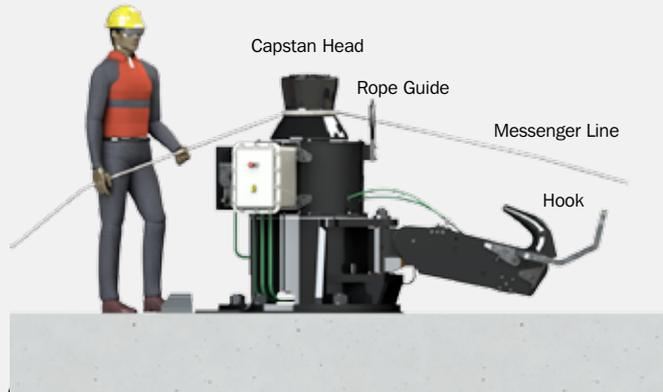
The Trelleborg Marine Systems electric capstan motor is housed within a protective structure (typically the QRH base). The capstan motor is factory run-in and mated with a gearbox, which is oil-filled for life. The capstan motor Direct On Line (DOL) motor starter allows the operator to control motor operation through a footswitch, Emergency Stop Switch (E-Stop) and direction selector switch. Ribbed capstan head and rope guide are fitted as standard. Hazardous and safe area models are available.



AREA CLASSIFICATION	LINE PULL (tonnes)	STARTING PULL (tonnes)	MOTOR SIZE (kW)
Hazardous	1	2	5.5
Safe			
Hazardous	1.5	3	7.5
Safe			
Hazardous	2	4	11
Safe			
Hazardous	3	6	15
Safe			

1 CAPSTAN GENERAL SPECIFICATIONS - STANDARD MODELS (For variances to standard product refer to Options and Upgrades)

1.1 Capstan Capacity



Note1: Starting pull is defined as 2 times the running pull
 Note2: Customised capstan capacities (speed and pull) available upon request.
 Note3: Refer to the specific project general arrangement drawing for overall dimensions, layout, bolt patterns and foundation details.

Capstan - Specifications

1 CAPSTAN GENERAL SPECIFICATIONS - STANDARD MODELS (For variances to standard product refer to Options and Upgrades)

1.2	Capstan Type	Reversible, with brake
1.3	Line Speed	Nominal 30 metres/minute
1.4	Environmental Protection (minimum)	Capstan motor and motor starter: IP56 minimum Footswitch: IP68 Note: Motor contains tropic-proofed windings
1.5	Brake Details	Automatic, spring applied brake when de-energised Holding torque = 150% of motor torque.
1.6	Mounting Requirements	See QRH base details
1.7	Fasteners	Where possible all fasteners used in the assembly of the support structure are 316 stainless steel.

2 CAPSTAN MOTOR ELECTRICAL SPECIFICATIONS - ALL MODELS

2.1	Motor Control	Direct On Line (DOL) motor starter	
2.2	Motor Starter Housing	Hazardous Area Model Marine grade aluminium, painted	Non Hazardous Area Model Stainless steel
2.3	Capstan Electrical Controls	Selector Switch: Counter clockwise / OFF / clockwise Emergency Stop: Push to set, twist to reset Footswitch: Depress to operate	
2.4	Footswitch	IP68 industrial footswitch with foot guard Construction: 316 stainless steel or Aluminium. (Hazardous Area model intrinsically safe)	
2.5	Space Heater	Single-phase	
2.6	Motor Protection	Electronic overload (thermal trip and phase failure protection) (automatic reset)	
2.7	Motor Type/ Insulation	Four-pole Insulation Class F Tropic-proof windings	
2.8	Motor Electrical Parameters	3Ø (with or without neutral): 380 to 480 VAC(+/-10%) @ 50 Hz or 60 Hz (+/-5%) Note: voltages outside these ranges available upon request	
2.9	Incoming 3 Ø Power Connections	Metric: 32 mm entry Maximum cable termination size=25 mm ² (stranded) or 16 mm ² (solid) Note: If conductor sizes are larger than the specified cables, then a separate junction box is to be provided (by others). Note: imperial entries available upon request.	
2.10	Surface Treatment	Refer section: QRH & HOOK BASE SURFACE TREATMENT	

3 OPTIONS

3.1	Freestanding Capstan Base (FSC)	Freestanding capstan base (used when hook base is not present) structures to A572 Grade 50 alternatively A3678 Grade 350. Note: Model Numbers will begin with FSC
3.2	Electrical Insulation (EI)	Isolates each capstan from jetty structure (material: nylon)

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