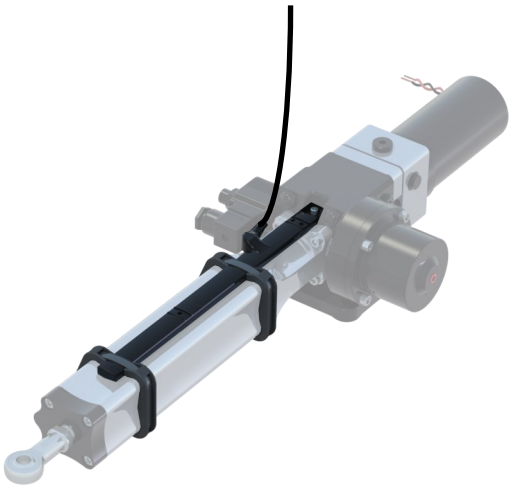
Hy-ProDrive
Marine Steering Technology

R4660-a Rudder Position Sensor



For Hy-Pro drive units:.

ML+40 S	200mm
ML+40 M	250mm
ML+40 L	300mm
HS+40 M	250mm

www.hypro.co.uk

Hydraulic Projects Ltd, Dawlish, Devon, EX7 0NH, UK
tel: +44 (0)1626 863634

R4660m01 ISS.02

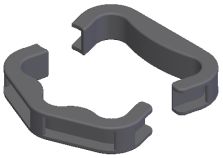
Compatible With Course Computers:

Coursemaster CM85i / CM95 / CM950
Coursemaster CM650
Coursemaster CM880
Furuno NAVpilot 300
Furuno NAVpilot 700 / 711 / 720 / 711C
Garmin GHP12ECU / ECU14 / Smart Pump V2
Humminbird SCP110 Course Computer
Navico NAC-1 / NAC-2
NKE Gyropilot 3
Raymarine ACU100 / ACU150
Raymarine ACU200 / ACU300 / ACU400

Box Contents:

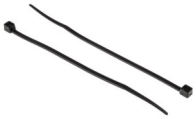
A

B 300 mm *



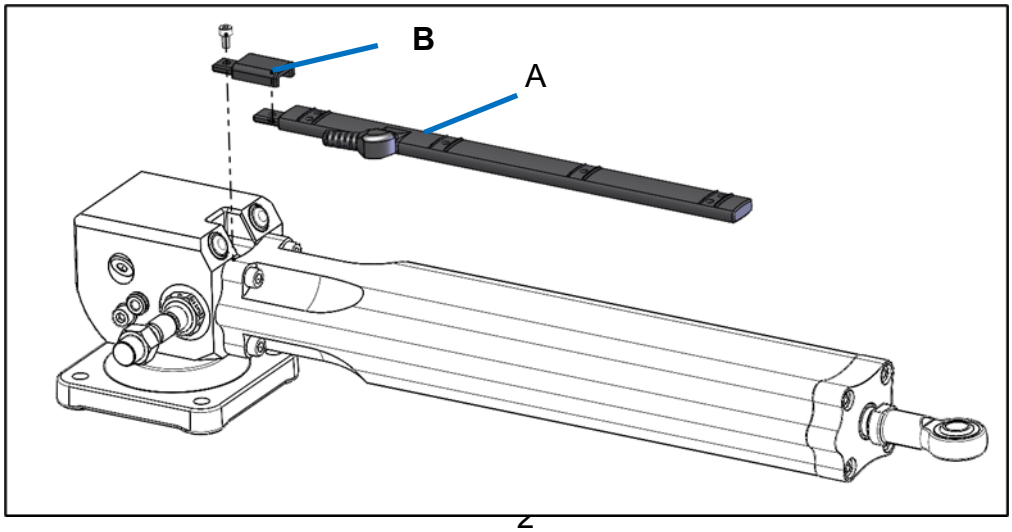
C x 2

D



E

*300 mm

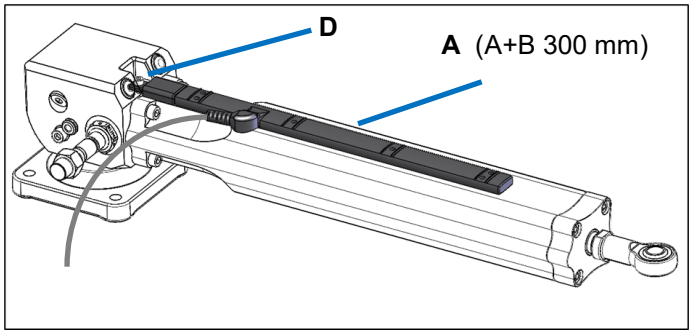


Installation

To avoid possible personal injury and damage to your boat, the autopilot system should be installed by a qualified marine installer. Specific knowledge of marine steering and electrical systems is required for proper installation.

You are responsible for the safe and prudent operation of your vessel. The autopilot is a tool that enhances your capability to operate your boat. It does not relieve you of the responsibility of safely operating your boat. Avoid navigational hazards and never leave the helm unattended.

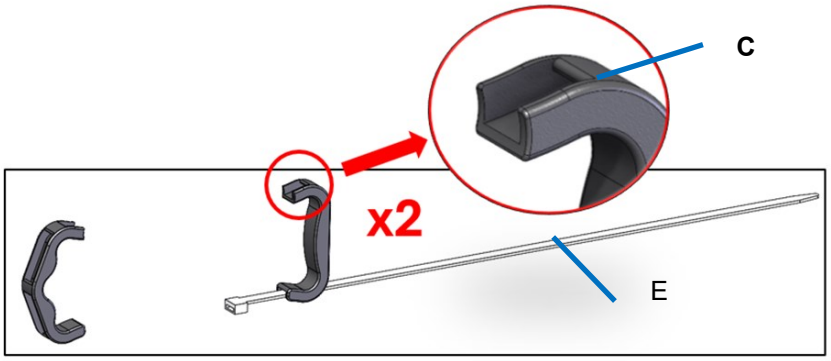
The feedback unit may be affected by magnetic interference. Marine speakers or similar devices must not be mounted within 20 cm of the unit. Mount at least 1.5 m from compasses.

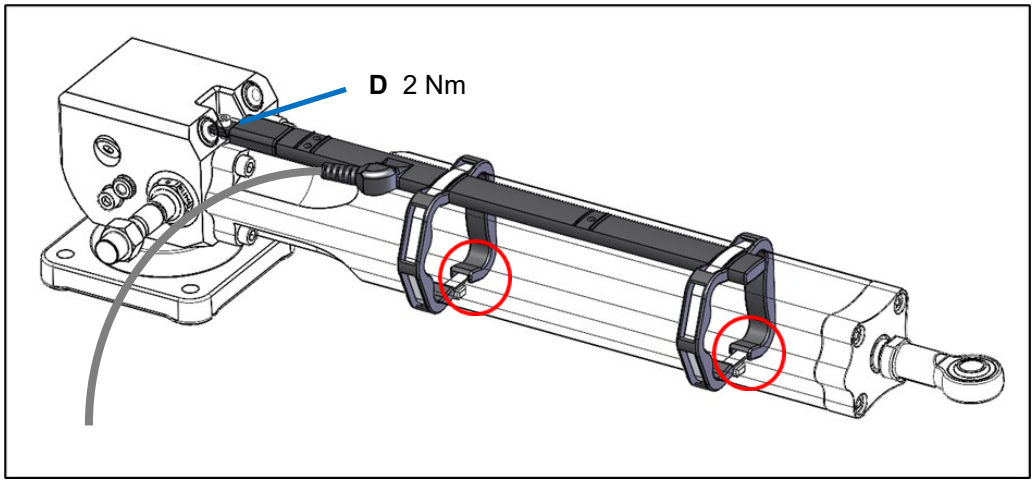


Place **A** (or A+B for 300 mm cylinders) as shown and fit **D** loosely.

Align **C** x 4 with cylinder grooves.

Thread **E** through **C** x 4 and tighten evenly under the cylinder. **Do not distort C**. Cut off excess.





Tighten **D** to 2 Nm torque.

Connection to Course Computer

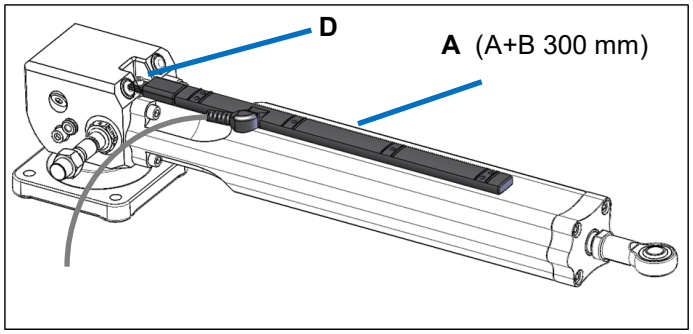
https://www.hypro.co.uk/mi

Installation

Pour éviter tout risque de blessure et d'endommagement de votre bateau, le système de pilote automatique doit être installé par un installateur marin qualifié. Une connaissance approfondie des systèmes de direction et électriques marins est requise pour une installation correcte.

Vous êtes responsable de la conduite sûre et prudente de votre bateau. Le pilote automatique est un outil qui améliore votre capacité à piloter votre bateau. Il ne vous dégage pas de la responsabilité de le faire en toute sécurité. Évitez les dangers de la navigation et ne laissez jamais la barre sans surveillance.

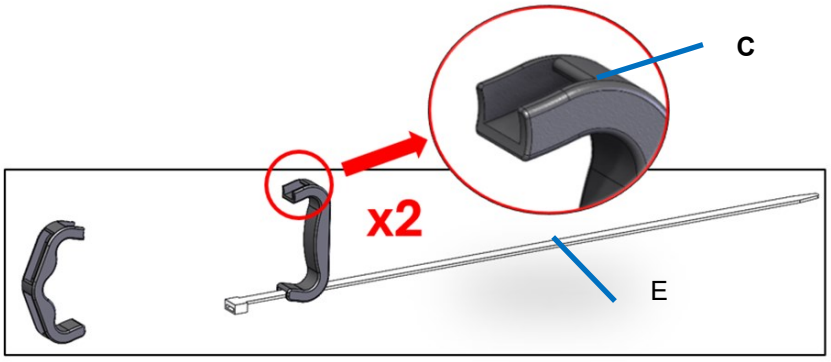
L'unité de retour d'information peut être affectée par des interférences magnétiques. Les haut-parleurs marins ou appareils similaires ne doivent pas être installés à moins de 20 cm de l'unité. Installez-la à au moins 1,5 m des compas.

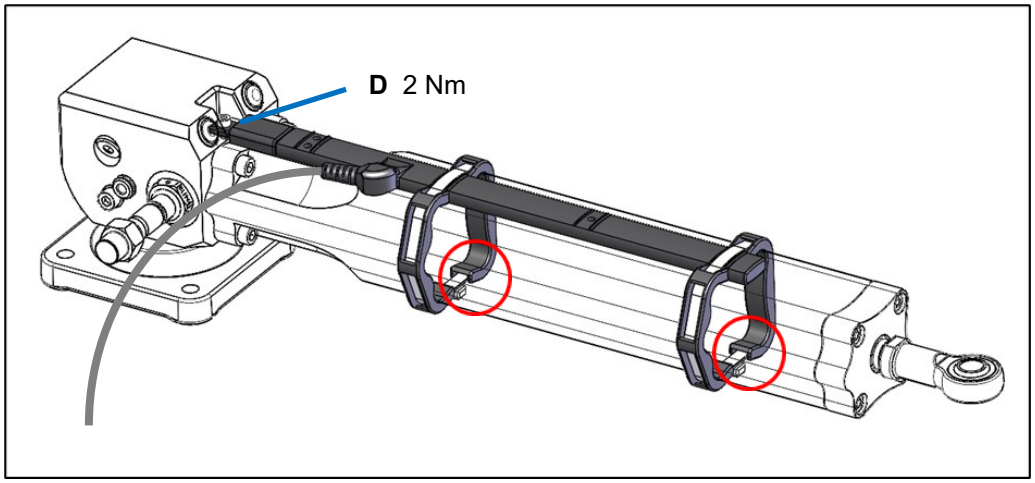


Placez A (ou A+B pour les cylindres de 300 mm) comme indiqué et installez D sans serrer.

Alignez C x 4 avec les rainures du cylindre.

Vissez E dans C x 4 et serrez uniformément sous le cylindre. Ne déformez pas C. Coupez l'excédent.





Serrez D à un couple de 2 Nm.

Connexions électriques

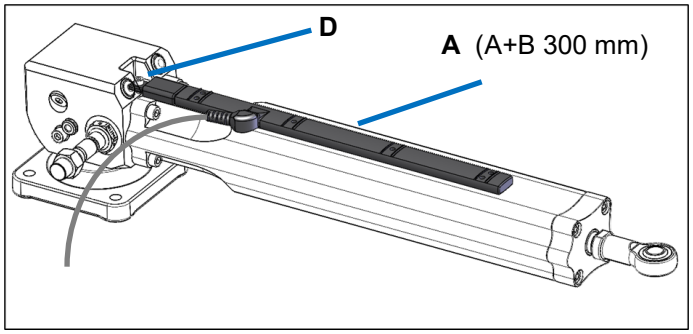
https://www.hypro.co.uk/mi

Installazione

Per evitare possibili lesioni personali e danni all'imbarcazione, il sistema di pilotaggio automatico deve essere installato da un installatore marino qualificato. Per una corretta installazione è richiesta una conoscenza specifica dei sistemi di sterzo e elettrici marini.

L'utente è responsabile della conduzione sicura e prudente della propria imbarcazione. Il pilota automatico è uno strumento che migliora la capacità di manovrare l'imbarcazione. Non solleva l'utente dalla responsabilità di una conduzione sicura dell'imbarcazione. Evitare i pericoli di navigazione e non lasciare mai il timone incustodito.

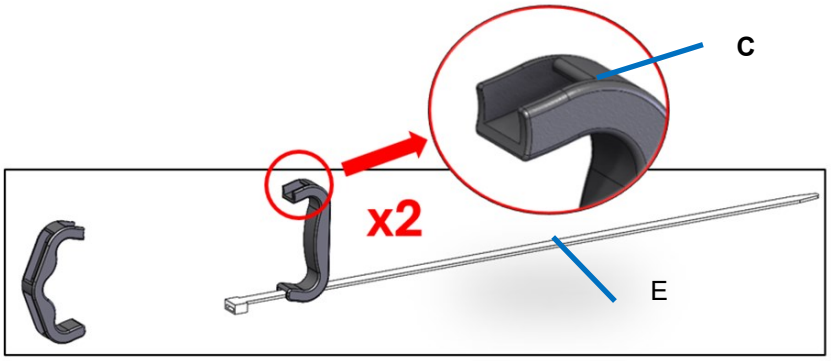
L'unità di feedback potrebbe essere influenzata da interferenze magnetiche. Altoparlanti marini o dispositivi simili non devono essere installati a meno di 20 cm dall'unità. Installare ad almeno 1,5 m dalle bussole.

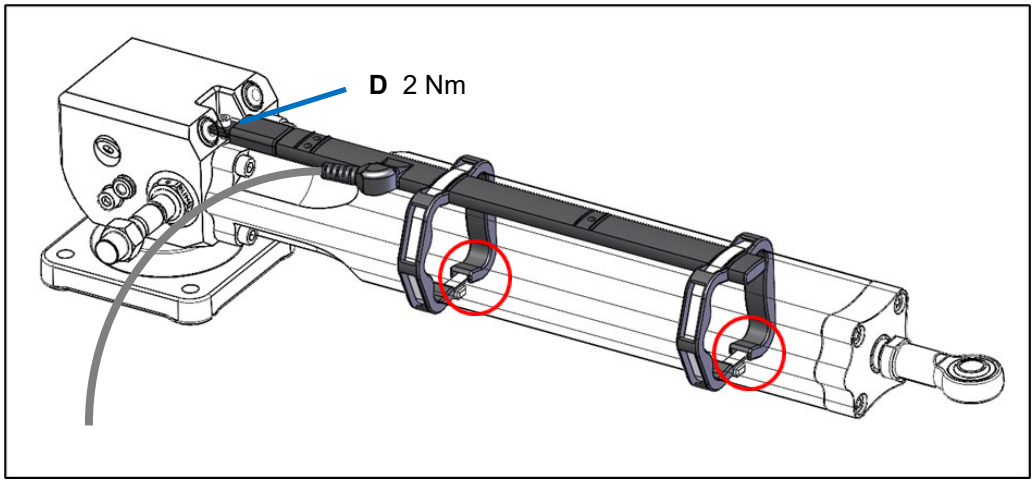


Posizionare A (o A+B per cilindri da 300 mm) come mostrato e montare D senza stringere troppo.

Allineare C x 4 con le scanalature del cilindro.

Infilare E attraverso C x 4 e serrare uniformemente sotto il cilindro. Non deformare C. Tagliare l'eccesso.





Serrare D con una coppia di 2 Nm.

Collegamenti elettrici

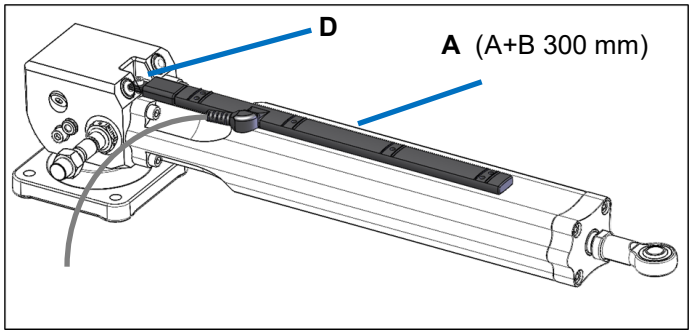
https://www.hypro.co.uk/mi

Installation

Um mögliche Verletzungen und Schäden an Ihrem Boot zu vermeiden, sollte das Autopilotsystem von einem qualifizierten Schiffsinstallateur installiert werden. Für eine ordnungsgemäße Installation sind spezielle Kenntnisse über Schiffssteuerung und elektrische Systeme erforderlich.

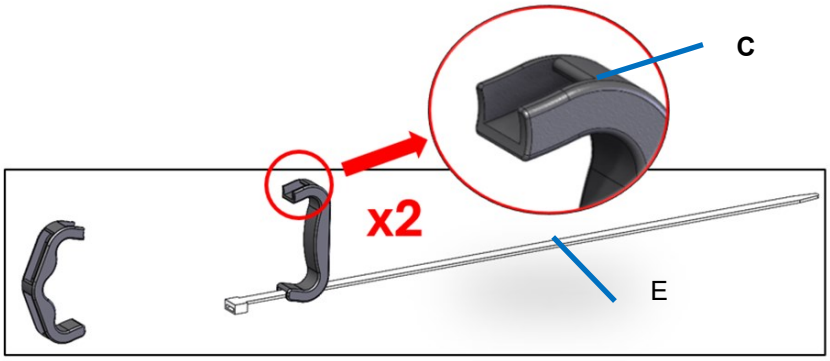
Sie sind für den sicheren und umsichtigen Betrieb Ihres Bootes verantwortlich. Der Autopilot ist ein Hilfsmittel, das Ihre Fähigkeiten zur Steuerung Ihres Bootes verbessert. Er entbindet Sie nicht von der Verantwortung für die sichere Führung Ihres Bootes. Vermeiden Sie Gefahren bei der Navigation und lassen Sie das Ruder niemals unbeaufsichtigt.

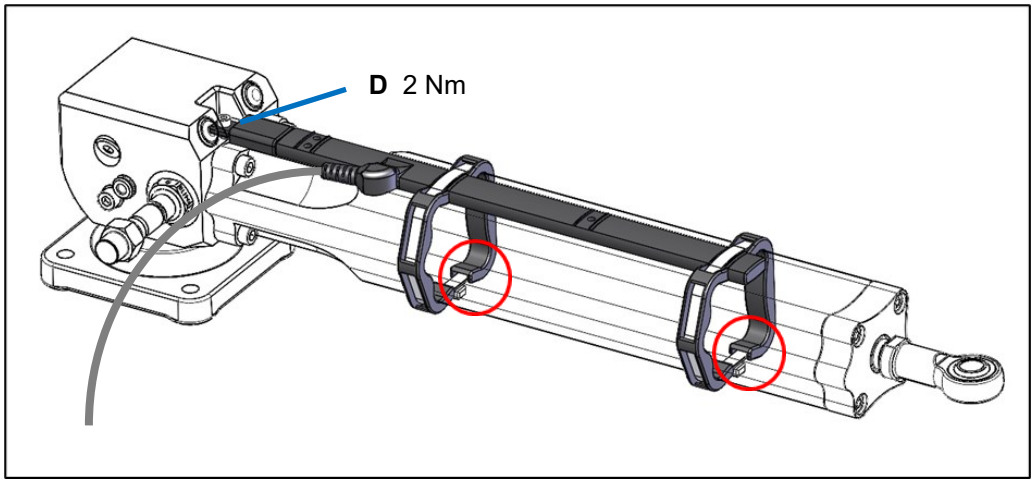
Die Feedback-Einheit kann durch magnetische Störungen beeinträchtigt werden. Marinelautsprecher oder ähnliche Geräte dürfen nicht näher als 20 cm vom Gerät montiert werden. Montieren Sie den Autopiloten mindestens 1,5 m von Kompassen entfernt.



Platzieren Sie A (oder A+B für 300-mm-Zylinder) wie gezeigt und passen Sie D locker an.

Richten Sie C x 4 an den Zylindernuten aus.
Fädeln Sie E durch C x 4 und ziehen Sie es gleichmäßig unter dem Zylinder fest. Achten Sie darauf, C nicht zu verformen. Überstehende Teile abschneiden.





D mit 2 Nm Drehmoment festziehen.

Elektrischer Anschluss

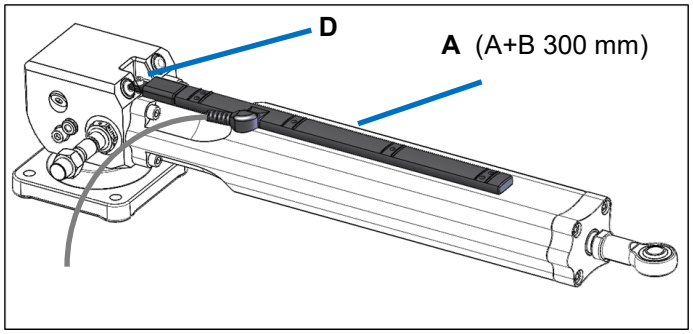
https://www.hypro.co.uk/mi

Instalación

Para evitar posibles lesiones personales y daños a su embarcación, el sistema de piloto automático debe ser instalado por un instalador marino cualificado. Se requieren conocimientos específicos de sistemas de gobierno y eléctricos marinos para una instalación correcta.

Usted es responsable de la operación segura y prudente de su embarcación. El piloto automático es una herramienta que mejora su capacidad para operar su embarcación. No le exime de la responsabilidad de operarla con seguridad. Evite los peligros de la navegación y nunca deje el timón sin supervisión.

La unidad de retroalimentación puede verse afectada por interferencias magnéticas. Los altavoces marinos o dispositivos similares no deben instalarse a menos de 20 cm de la unidad. Móntelo al menos a 1,5 m de las brújulas.



Coloque A (o A+B para cilindros de 300 mm) como se muestra y ajuste D sin apretar
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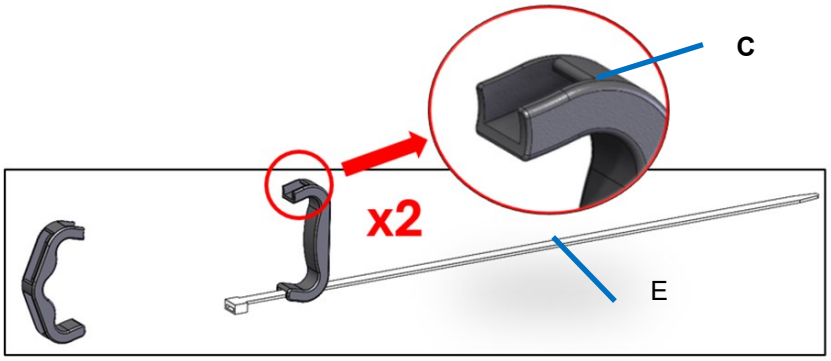
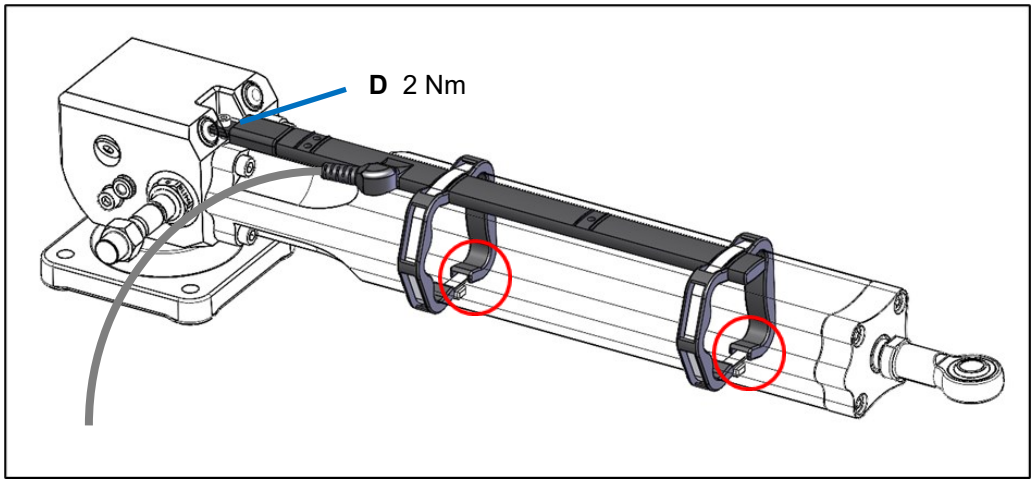
Alinee C x 4 con las ranuras del cilindro.

Pase E a través de C x 4 y apriete uniformemente bajo el cilindro. No deforme C. Corte el exceso.





Apretar D a un torque de 2 Nm.

Conexión eléctrica

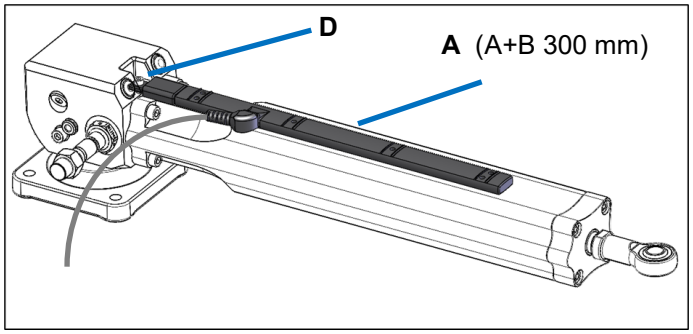
https://www.hypro.co.uk/mi

Installatie

Om mogelijk persoonlijk letsel en schade aan uw boot te voorkomen, dient het stuurautomaatsysteem te worden geïnstalleerd door een gekwalificeerde scheepsinstallateur. Specifieke kennis van scheepsbesturing en elektrische systemen is vereist voor een correcte installatie.

U bent verantwoordelijk voor de veilige en zorgvuldige bediening van uw vaartuig. De stuurautomaat is een hulpmiddel dat uw mogelijkheden om uw boot te besturen vergroot. Het ontslaat u echter niet van de verantwoordelijkheid om uw boot veilig te bedienen. Vermijd navigatiegevaren en laat het roer nooit onbeheerd achter.

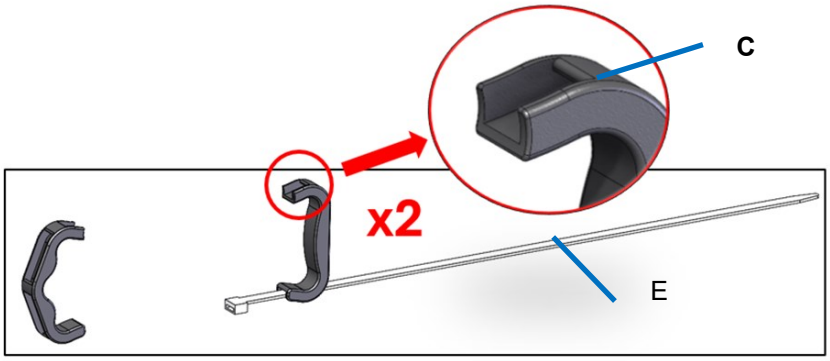
De feedbackunit kan worden beïnvloed door magnetische interferentie. Marineluidsprekers of soortgelijke apparaten mogen niet binnen 20 cm van de unit worden gemonteerd. Monteer de unit op minimaal 1,5 m afstand van kompassen.

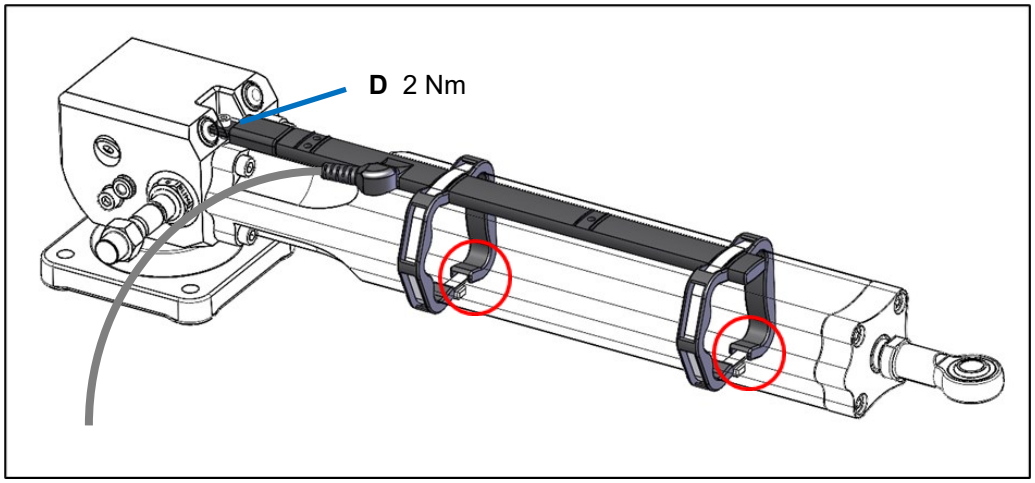


Plaats A (of A+B voor cilinders van 300 mm) zoals afgebeeld en monteer D losjes.

Lijn C x 4 uit met de cilindergroeven.

Rijd E door C x 4 en draai gelijkmatig vast onder de cilinder. Vervorm C niet. Knip overtollig materiaal af.





Draai D vast met een koppel van 2 Nm.

Elektrische verbinding

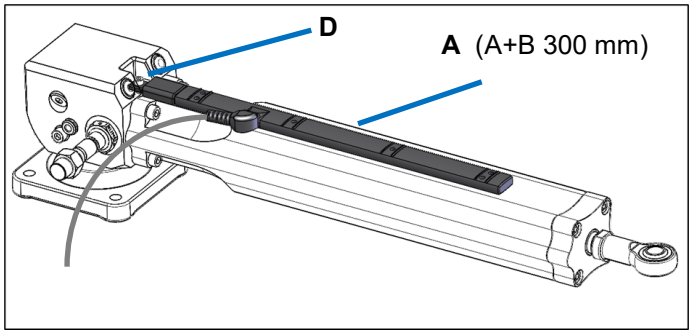
https://www.hypro.co.uk/mi

Installation

For at undgå mulig personskade og skade på din båd, bør autopilotsystemet installeres af en kvalificeret marineinstallatør. Specifik viden om marinestyring og elektriske systemer er nødvendig for korrekt installation.

Du er ansvarlig for sikker og forsigtig betjening af dit fartøj. Autopiloten er et værktøj, der forbedrer din evne til at betjene din båd. Den fritager dig ikke for ansvaret for sikker betjening af din båd. Undgå navigationsfarer, og lad aldrig roret være uden opsyn.

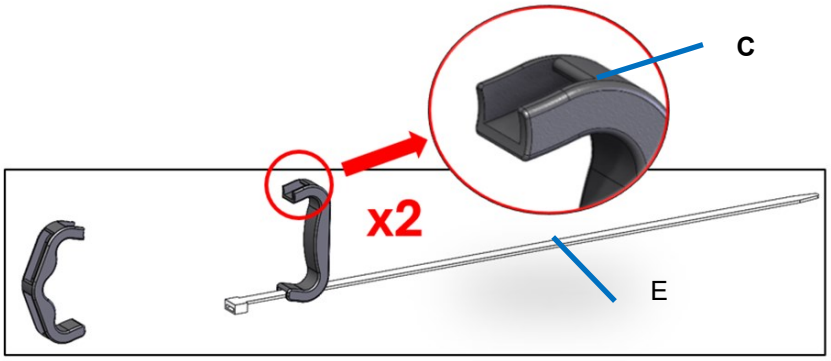
Feedbackenheden kan blive påvirket af magnetisk interferens. Marinehøjttalere eller lignende enheder må ikke monteres inden for 20 cm fra enheden. Monter mindst 1,5 m fra kompasser.

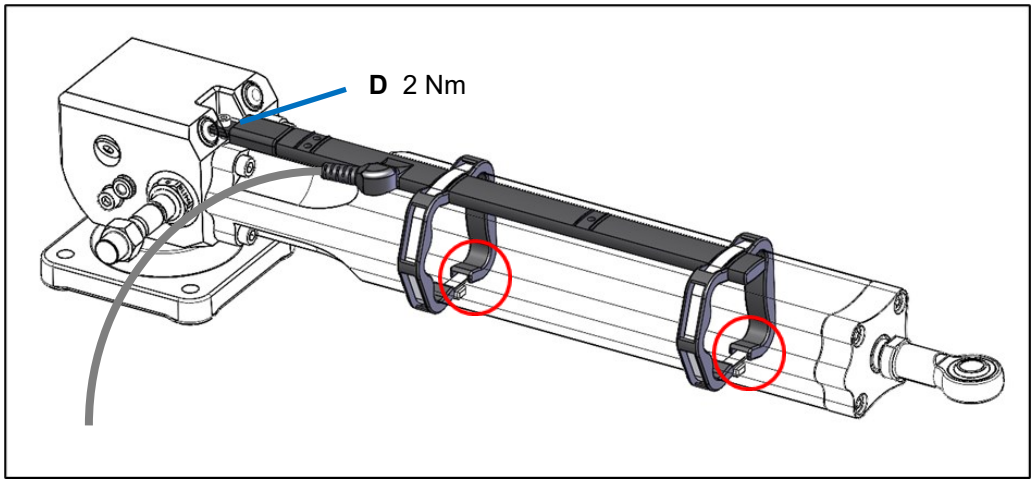


Placer A (eller A+B for 300 mm cylindre) som vist, og monter D løst.

Juster C x 4 med cylinderens riller.

Tråd E gennem C x 4 og spænd jævnt under cylinderen. Undgå at vride C. Skær overskydende af.





Spænd D til et moment på 2 Nm.

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Elektrisk tilslutning

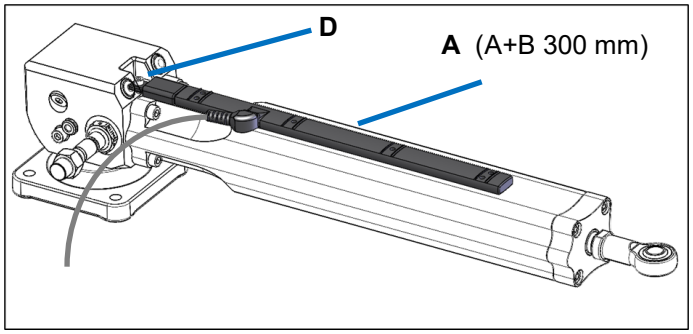
https://www.hypro.co.uk/mi

Installation

För att undvika eventuella personskador och skador på din båt bör autopilotsystemet installeras av en kvalificerad marin installatör. Specifik kunskap om marin styrning och elektriska system krävs för korrekt installation.

Du är ansvarig för säker och försiktig användning av ditt fartyg. Autopiloten är ett verktyg som förbättrar din förmåga att framföra din båt. Den befriar dig inte från ansvaret att framföra din båt på ett säkert sätt. Undvik navigationsrisker och lämna aldrig rodret utan uppsikt.

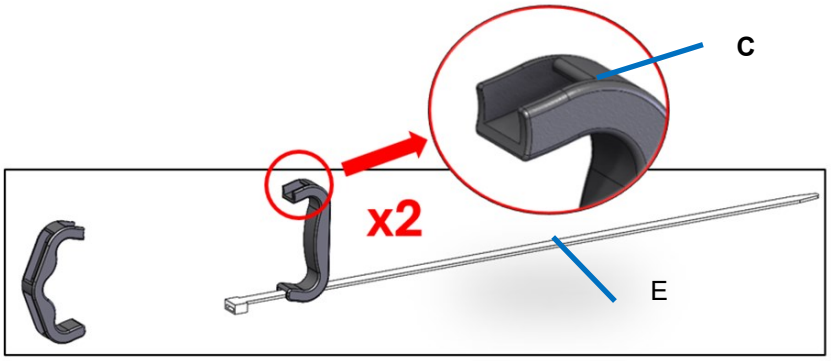
Feedbackenheten kan påverkas av magnetiska störningar. Marinhögtalare eller liknande enheter får inte monteras inom 20 cm från enheten. Montera minst 1,5 m från kompasser.

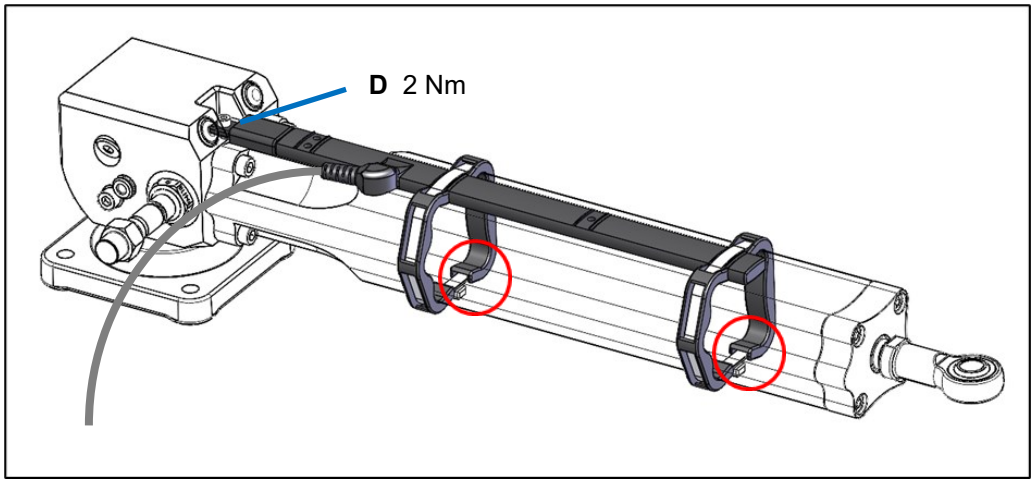


Placera A (eller A+B för 300 mm cylindrar) som visas och montera D löst.

Rikta in C x 4 med cylinderns spår.

Gänga E genom C x 4 och dra åt jämnt under cylindern. Förvräng inte C. Skär bort överflödigt.





Dra åt D till 2 Nm vridmoment

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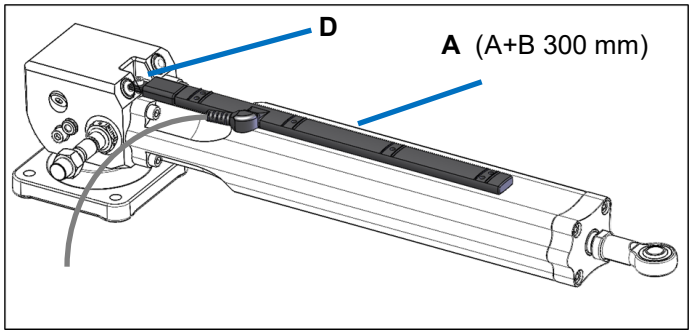
Elektrisk anslutning

https://www.hypro.co.uk/mi

Εγκατάσταση

Για να αποφύγετε πιθανούς τραυματισμούς και ζημιές στο σκάφος σας, το σύστημα αυτόματου πιλότου πρέπει να εγκατασταθεί από εξειδικευμένο τεχνικό εγκατάστασης σκαφών. Για την σωστή εγκατάσταση απαιτούνται ειδικές γνώσεις συστημάτων διεύθυνσης και ηλεκτρικών συστημάτων σκαφών.
Είστε υπεύθυνοι για την ασφαλή και συνετή λειτουργία του σκάφους σας. Ο αυτόματος πιλότος είναι ένα εργαλείο που ενισχύει την ικανότητά σας να χειρίζεστε το σκάφος σας. Δεν σας απαλλάσσει από την ευθύνη της ασφαλούς λειτουργίας του σκάφους σας. Αποφύγετε τους κινδύνους πλοήγησης και μην αφήνετε ποτέ το τιμόνι χωρίς επίβλεψη.

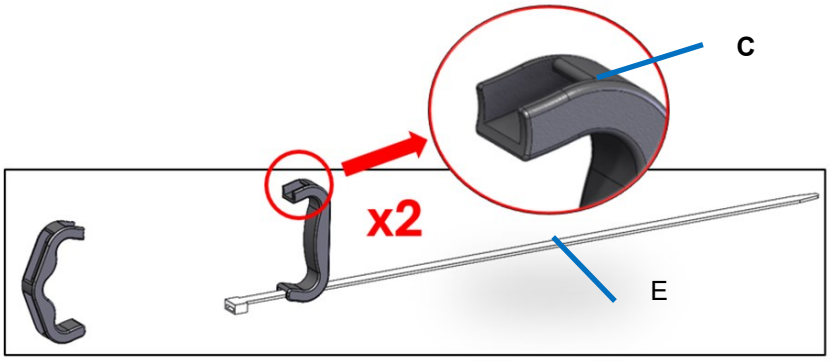
Η μονάδα ανάδρασης ενδέχεται να επηρεαστεί από μαγνητικές παρεμβολές. Τα ηχεία θαλάσσης ή παρόμοιες συσκευές δεν πρέπει να τοποθετούνται σε απόσταση μικρότερη των 20 cm από τη μονάδα. Τοποθετήστε το σε απόσταση τουλάχιστον 1,5 m από τις πυξίδες.

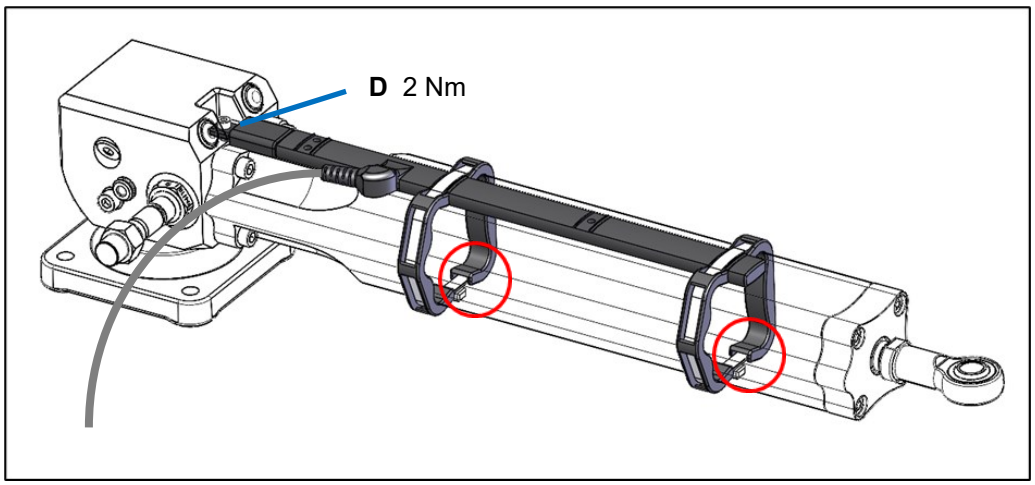


Τοποθετήστε το A (ή A+B για κυλίνδρους 300 mm) όπως φαίνεται και τοποθετήστε χαλαρά το D.

Ευθυγραμμίστε το C x 4 με τις αυλακώσεις του κυλίνδρου.

Περάστε το E μέσα από το C x 4 και σφίξτε ομοιόμορφα κάτω από τον κύλινδρο. Μην παραμορφώνετε το C. Κόψτε την περίσσεια.





Σφίξτε το D με ροπή 2 Nm

Ηλεκτρική σύνδεση

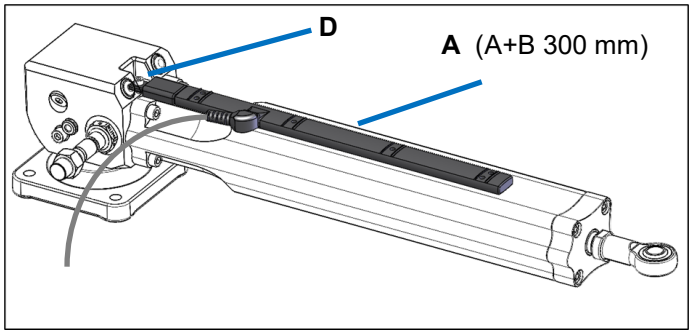
https://www.hypro.co.uk/mi

Instalacja

Aby uniknąć obrażeń ciała i uszkodzenia łodzi, system autopilota powinien zostać zainstalowany przez wykwalifikowanego instalatora morskiego. Do prawidłowej instalacji wymagana jest specjalistyczna wiedza z zakresu morskich systemów sterowania i elektrycznych.

Jesteś odpowiedzialny za bezpieczną i rozważną obsługę swojej łodzi. Autopilot to narzędzie, które zwiększa Twoje możliwości sterowania łodzią. Nie zwalnia Cię on z odpowiedzialności za bezpieczne sterowanie łodzią. Unikaj zagrożeń nawigacyjnych i nigdy nie zostawiaj steru bez nadzoru.

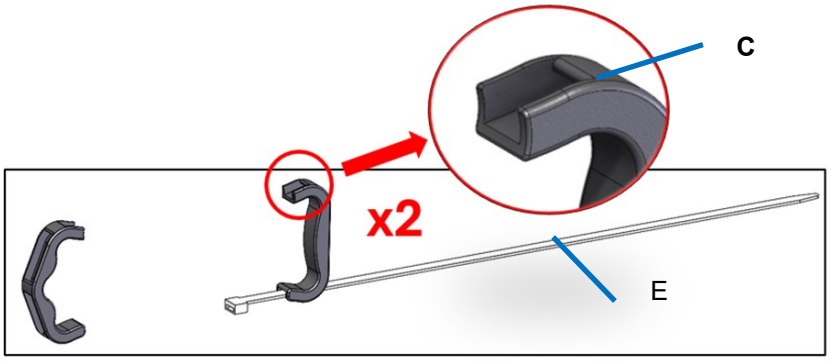
Na działanie jednostki sprzężenia zwrotnego mogą wpływać zakłócenia magnetyczne. Głośników morskich i podobnych urządzeń nie wolno montować w odległości mniejszej niż 20 cm od jednostki. Zamontuj je w odległości co najmniej 1,5 m od kompasu.

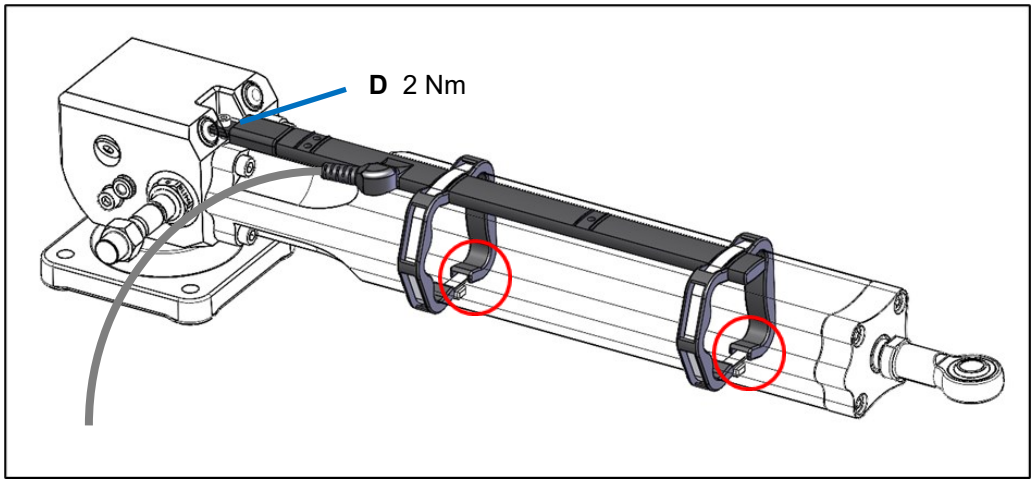


Umieść element A (lub element A+B w przypadku cylindrów o średnicy 300 mm) zgodnie z rysunkiem i luźno dopasuj element D.

Dopasuj C x 4 do rowków cylindra.

Przewlecz E przez C x 4 i dokręć równomiernie pod cylindrem. Nie odkształcaj C. Odetnij nadmiar.





Dokręć D momentem 2 Nm.

Połączenie elektryczne

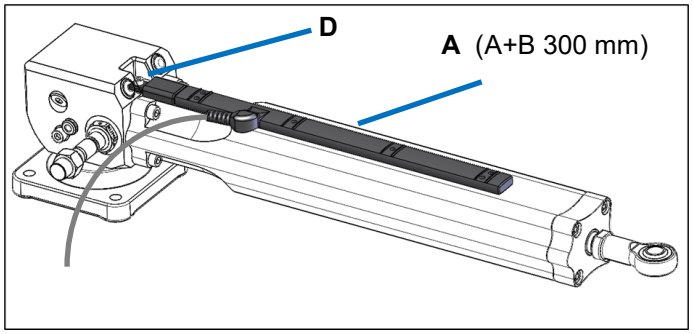
https://www.hypro.co.uk/mi

Montaža

Kako biste izbjegli moguće tjelesne ozljede i oštećenje vašeg plovila, sustav autopilota trebao bi ugraditi kvalificirani instalater plovila. Za pravilnu ugradnju potrebno je specifično znanje o brodskom upravljanju i električnim sustavima.

Vi ste odgovorni za sigurno i razborito upravljanje svojim plovilom. Autopilot je alat koji poboljšava vašu sposobnost upravljanja plovilom. To vas ne oslobađa odgovornosti za sigurno upravljanje plovilom. Izbjegavajte navigacijske opasnosti i nikada ne ostavljajte kormilo bez nadzora.

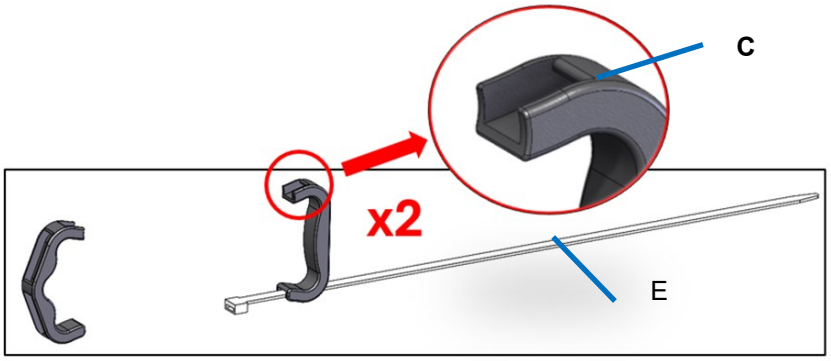
Na jedinicu za povratne informacije mogu utjecati magnetske smetnje. Brodski zvučnici ili slični uređaji ne smiju se montirati unutar 20 cm od jedinice. Montirajte najmanje 1,5 m od kompasa.

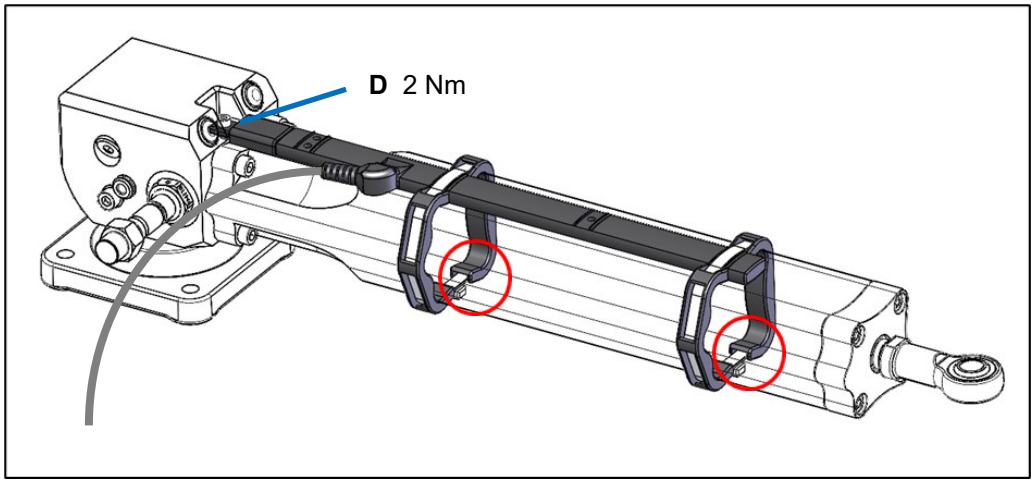


Postavite A (ili A+B za cilindre od 300 mm) kao što je prikazano i labavo pričvrstite D.

Poravnajte C x 4 s utorima cilindra.

Provucite E kroz C x 4 i ravnomjerno zategnite ispod cilindra. Nemojte savijati C. Odrežite višak.





Zategnite D na moment od 2 Nm.

Električni priključak

https://www.hypro.co.uk/mi

Specification

Mass		80 g	
Ingress protection		IP67	
Electromagnetic compatibility		BS EN 60945:2002	
Safe distance from (4) ;-			
	Steering compass	1.0 m	
	Standard compass	1.5 m	
Power-up time (3)		300 ms	
Measurement delay		10 ms	
RMS deviation from linear		0.3 mm	
Output resistance		1.2 KΩ	
Wire colours	Black	Gnd	
	Red	Vsupply	
	Yellow	Output	
Supply current		20 mA	
	Min	Typ	Max
Supply voltage (Vsupply)	3.0 V	5.0 V	15.0 V
Output voltage range Vsupply <=5.5V (1)	0.04 x Vsupply (Fully extended)		0.96 x Vsupply (Fully retracted)
Output voltage range Vsupply >5.5V (2)	0.22 V (fully extended)		5.28 V (fully retracted)

1) For Vsupply in the range 3.0V to 5.5V the sensor emulates a potentiometer (the output is ratiometric)
2) For Vsupply above 5.5V the output range is the same as it is at 5.5V
3) Time from Vsupply reaching 3.0V to output becoming valid
4) Per BS EN 60945 11.2

Declaration Of Compliance For RoHS

Products: R4660-a Rudder Position Sensor

These product(s) comply with:

EU RoHS Directive 2011/65/EU and its amendments, including Directive 2015/863. The product(s) and each homogenous material within the product(s) do not contain Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr6+), Polybrominated biphenyls (PBB), or Polybrominated diphenyl ethers (PBDE) above the maximum concentration values.

Other standards complied with: **EN 60945: 2002** Electromagnetic compliance for maritime navigation and radio communication equipment and systems

This declaration of conformity is issued under the sole responsibility of the manufacturer; Hydraulic Projects Ltd, Dawlish Business Park, Dawlish, Devon EX7 0NH, United Kingdom. www.hypro.co.uk

Date: 01/08/2025 Signed:

Elaine Slater, Managing Director

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Marine Steering Technology