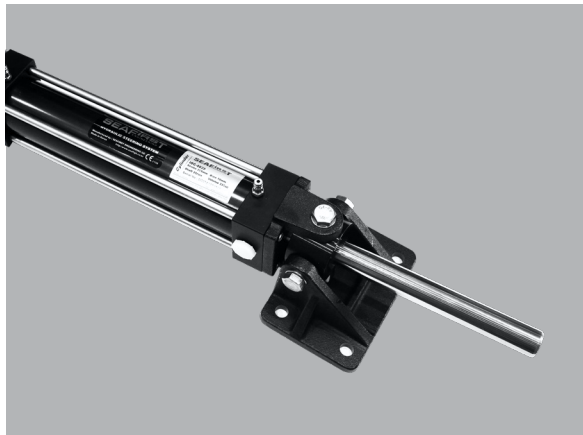


2021
2022



HYDRAULIC STEERING FOR INBOARD



An aerial photograph of a white speedboat moving across a deep blue ocean, leaving a white wake. A digital graphic of white dots arranged in concentric, overlapping circles is overlaid on the right side of the image, creating a sense of motion and technology.

SEAFIRST
ENGINEERING

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|---|----|

Hydraulic steering **05**

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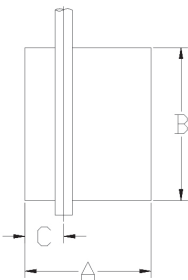
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Request form for product recommendation

The following data is requested to help you select the products.
Please submit this form to the supplier and get a recommendation for your boat.

| 1. Customer Information | | | |
|--|--|---|--|
| Company name | | | |
| Contact person | | | |
| Tel | | Email | |
| 2. Boat specification | | | |
| Boat's speed (max) | | | |
| Number of rudder | | | |
| Total angle of rudder | | | |
| Rudder Torque | | | |
| Engine horse power | | | |
| 3. Steering system previously used on this boat, or similar types of boat (if any) | | | |
| (Write the information you know as accurately as possible, including the type of steering system and model name of cylinder) | | | |
| Brand | | | |
| Product specifications | | | |
| 4. Rudder Dimensions | | | |
|  | | Rudder dimension - mm() inch () A B C | |
| 5. Other requests | | | |
| | | | |

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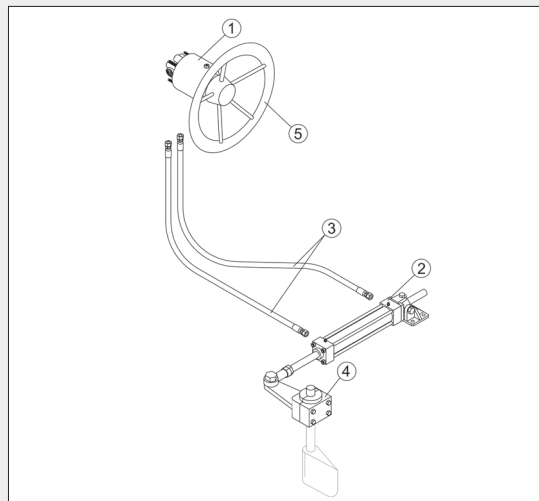
HYDRAULIC STEERING



Hydraulic Steering for Single Rudder Boat

Cylinder Torque 34~117kgf.m

MI-N TYPE



Application Guide

| Model | System Basic Components | | Hose | Wheel Turn | Torque | Applicable |
|-----------|-------------------------|-----------|------|--------------|--------|------------|
| | Cylinder | Helm Pump | Size | Lock to Lock | kgf.m | Engine HP |
| MI30N-22 | IOC4020 | NSH022 | 3/8" | 5.5 | 34 | 75hp |
| MI50N-25 | IOC4021 | NSH025 | | 6.7 | 48 | 75hp |
| MI60N-30 | IOC4022 | NSH030 | | 7.1 | 61 | 110hp |
| MI80N-37 | IOC5024 | NSH037 | | 7.1 | 75 | 110hp |
| MI100N-44 | IOC5025 | NSH044 | | 7.7 | 96 | 140hp |
| MI120N-44 | IOC5026 | NSH044 | | 9.3 | 117 | 180hp |

** For the various combination, see Page. 07

* Torque : Max Torque from cylinder at pressure 40kg/cm² and 35 degree

Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|-------------------------|---|----------|
| System Basic Components | ① | NSH022 ~ 044 | Helm Pump with fittings (PF 3/8 x 2pcs) | P. 20-21 |
| | ② | IOC4020~4022 | Cylinder with fittings (PF 3/8" x 2pcs) | P.24 |
| | | IOC5024~5026 | Cylinder with two types of fittings (PF3/8" x 2pcs, UNF 7/8 X 2pcs) | P.24 |
| System Components | ③ | NH06-SS-XX (Hose meter) | 3/8" Hose with 2pcs of PF 3/8" hose coupling on both ends | P. 27 |
| | ④ | Tiller arm | To convert the motion of cylinder into the motion of the rudder stock | P. 34 |
| | ⑤ | Steering Wheel | from ø350mm up to ø400mm | P. 33 |
| | No Number | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | C3520149 | Reusable hose coupling | P. 27 |
| | | OAK-300 | Oil Filling kit | P. 31 |
| | | SHB Wedge kit | To mount NSH Helm pump to mounting surface | P. 33 |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | Dual station kit | To add an additional station of helm pump | P. 17 |

All components sold in optional & being packed separately

Hydraulic Steering for Single Rudder Boat

Cylinder Torque 34~117kgf.m

Combination Table

| Helm pump Cylinder | NSH018 | NSH022 | NSH025 | NSH030 | NSH037 | NSH044 |
|-----------------------|--------|--------|--------|--------|--------|--------|
| IOC4020 | 6.7 | 5.5 | 4.8 | 4.0 | 3.2 | 2.7 |
| IOC4021 | 9.3 | 7.6 | 6.7 | 5.6 | 4.5 | 3.8 |
| IOC4022 | 11.9 | 9.8 | 8.6 | 7.2 | 5.8 | 4.9 |
| IOC5024 | 14.6 | 11.9 | 10.5 | 8.7 | 7.1 | 6.0 |
| IOC5025 | 18.7 | 15.3 | 13.5 | 11.2 | 9.1 | 7.7 |
| IOC5026 | 22.8 | 18.7 | 16.4 | 13.7 | 11.1 | 9.3 |
| IOC6325 | 33.3 | 27.3 | 24.0 | 20.0 | 16.2 | 13.6 |
| IOC6326 | 40.8 | 33.4 | 29.4 | 24.5 | 19.8 | 16.7 |

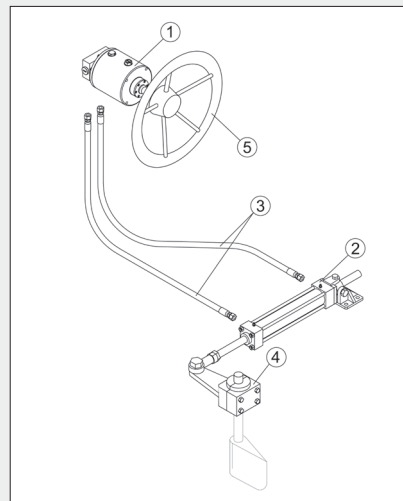
Our recommendation is colored

Numbers in squares are wheel turns from lock to lock

Hydraulic Steering for Single Rudder Boat

Cylinder Torque 118~329kgf.m

MI-H TYPE



Application Guide

| Model | System Basic Components | | Hose | Wheel Turn | Torque | Applicable |
|------------|-------------------------|----------------|--------------------|--------------|--------|------------|
| | Cylinder | Helm Pump | Size | Lock to Lock | kgf.m | Engine HP |
| MI120H-70 | IOC5024 | NHP070(T or S) | 3/8" Or 5/8" | 3.7 | 118 | 180hp |
| MI150H-70 | IOC5025 | NHP070(T or S) | | 4.8 | 151 | 250hp |
| MI190H-70 | IOC5026 | NHP070(T or S) | | 5.8 | 185 | 250hp |
| MI270H-90 | IOC6325 | NHP090S | 5/8" | 6.6 | 270 | 250hp |
| MI330H-120 | IOC6326 | NHP120S | | 6.1 | 329 | 350hp |

** For the various combination, see Page. 9

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree

Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|--------------------------|---|----------|
| System Basic Components | ① | NHP070(T or S) Helm pump | Helm Pump with fittings (PF 3/8 x 2pcs, UNF 7/8 x 2pcs) Two types of shaft (Taper 3/4" shaft or Straight 1" shaft) | P. 22-23 |
| | | NHP090S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) Straight 1" shaft | |
| | | NHP120S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) Straight 1" shaft | |
| | | | | |
| | ② | IOC 5024~6326 | IOC Cylinder with two types of fittings(PF 3/8 x 2pcs, UNF 7/8 x 2pcs) | P. 24 |
| System Components | ③ | NH06-SS-XX (Hose meter) | 3/8" Hose with 2pcs of PF 3/8" hose coupling on both ends | P. 27 |
| | | NH10-78-XX (Hose meter) | 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | |
| | ④ | Tiller Arm | To convert the motion of cylinder into the motion of the rudder stock | P. 34 |
| | ⑤ | Steering Wheel | From ø600mm up to ø1200mm. SW2-60W, SW2-70W, SW2-80W is for NHP070T | P. 33 |
| | No Number | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | RMF38 | Remote oil filling kit | P. 31 |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | Dual station kit | To add an additional station of helm pump | P. 18 |

All components sold in optional & being packed separately

Hydraulic Steering for Single Rudder Boat

Cylinder Torque 118~329kgf.m

Combination Table

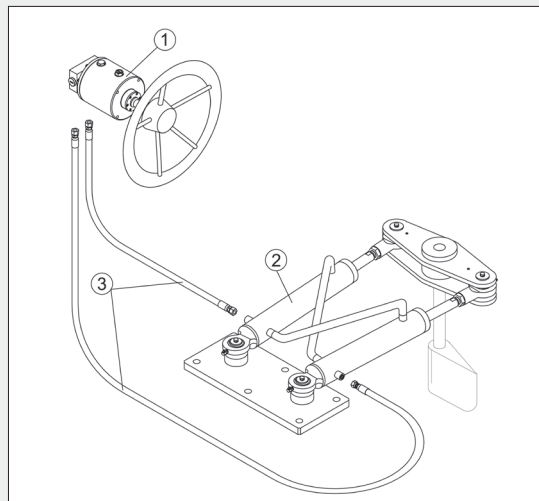
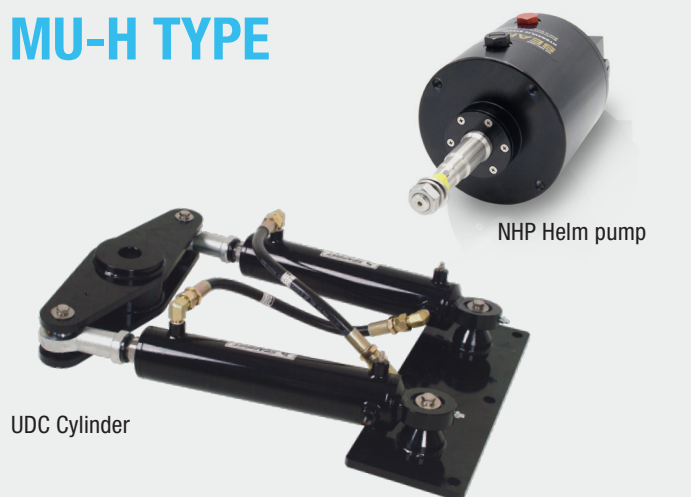
| <div>Helm pump</div> <div>Cylinder</div> | NHP070(T or S) | NHP090S | NHP120S |
|--|----------------|---------|---------|
| IOC4020 | 1.7 | 1.3 | 1.0 |
| IOC4021 | 2.4 | 1.9 | 1.4 |
| IOC4022 | 3.1 | 2.4 | 1.8 |
| IOC5024 | 3.7 | 2.9 | 2.2 |
| IOC5025 | 4.8 | 3.7 | 2.8 |
| IOC5026 | 5.9 | 4.6 | 3.4 |
| IOC6325 | 8.6 | 6.7 | 5.0 |
| IOC6326 | 10.5 | 8.2 | 6.1 |

Our recommendation is colored
Numbers in squares are wheel turns from lock to lock

Hydraulic Steering for Single Rudder Boat

Cylinder Torque 261~655kgf.m

MU-H TYPE



Application Guide

| Model | System Basic Components | | Hose | Wheel Turn | Torque | Applicable |
|------------|-------------------------|-----------|------|--------------|--------|------------|
| | Cylinder | Helm Pump | Hose | Lock to Lock | kgf.m | Engine HP |
| MU260H-90 | UDC5030S | NHP090S | 5/8" | 7.2 | 261 | 250 |
| MU480H-120 | UDC6335S | NHP120S | | 10.1 | 484 | 400 |
| MU660H-120 | UDC7040S | NHP120S | | 13.6 | 655 | 500 |

** For the various combination, see Page. 11

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree

Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|-------------------------|--|----------|
| System Basic Components | ① | NHP090S~120S | Helm pump with fittings(UNF 7/8 x 2pcs), Straight 1" Shaft | P. 22-23 |
| | ② | UDC5030S~7040S | UDC Cylinder with fittings (UNF 7/8 x 2pcs) | P. 25 |
| System Components | ③ | NH10-78-XX (Hose meter) | 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | P. 27 |
| | No Number | Steering Wheel | From ø600mm up to ø1200mm | - |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | RMF38 | Remote oil filling kit | P. 31 |
| | | Dual station kit | To add an additional station of helm pump | P. 18 |

All components sold in optional & being packed separately

Hydraulic Steering for Single Rudder Boat

Cylinder Torque 261 ~655kgf.m

Combination Table

| <div> <div>Helm pump</div> <div>Cylinder</div> </div> | NHP070(T or S) | NHP090S | NHP120S |
|---|----------------|---------|---------|
| UDC5030S | 9.3 | 7.3 | 5.5 |
| UDC6335S | 17.2 | 13.4 | 10.1 |
| UDC7040S | 23.4 | 18.2 | 13.6 |

Our recommendation is colored
Numbers in squares are wheel turns from lock to lock

Hydraulic Steering for Twin Rudder Boat

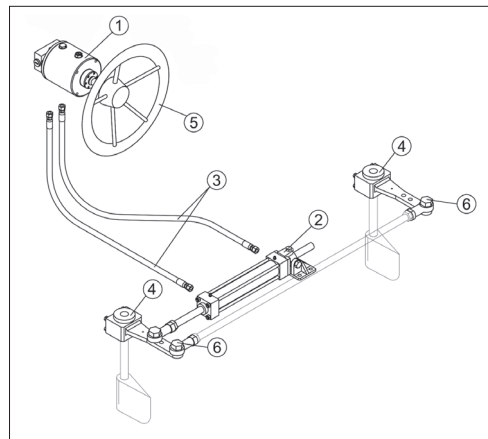
IOC type - one cylinder

Using mechanical tie bar (Non-supply)

Application Guide

| Model | System Basic Components | | Hose | Wheel Turn | Torque | Applicable |
|----------------|-------------------------|----------------|---------|--------------|--------|------------|
| | Cylinder | Helm Pump | Size | Lock to Lock | kgf.m | Engine HP |
| MI150H-70-T1M | IOC5025 | NHP070(T or S) | 3/8" or | 4.8 | 151 | 250hp |
| MI190H-70-T1M | IOC5026 | NHP070(T or S) | 5/8" | 5.8 | 185 | 250hp |
| MI270H-90-T1M | IOC6325 | NHP090S | 5/8" | 6.6 | 270 | 250hp |
| MI330H-120-T1M | IOC6326 | NHP120S | | 6.1 | 329 | 350hp |

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree

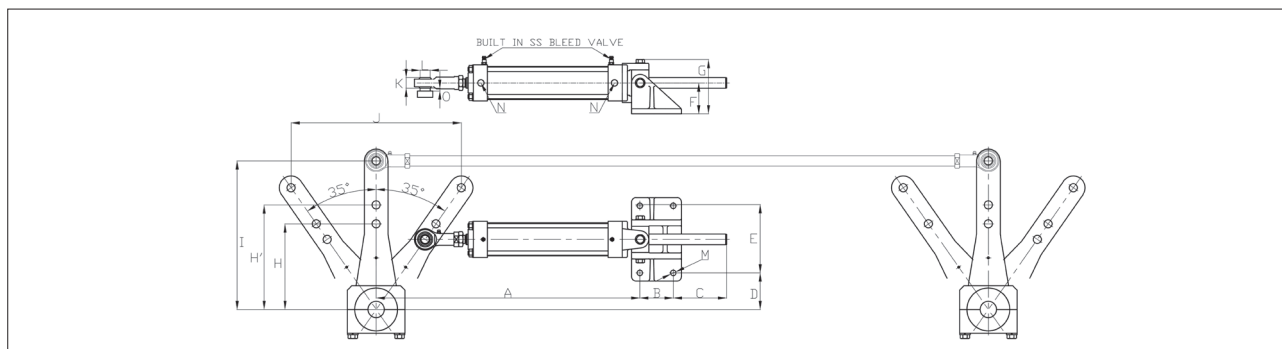


Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|--|---|----------|
| System Basic Components | ① | NHP070(T or S) Helm pump | Helm Pump with fittings (PF 3/8 x 2pcs, UNF 7/8 x 2pcs) Two types of shaft (Taper 3/4" shaft or Straight 1" shaft) | P. 22-23 |
| | | NHP090S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) Straight 1" shaft | |
| | | NHP120S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) Straight 1" shaft | |
| | | IOC5025~6326 | IOC Cylinder with two types of fittings(PF 3/8 x 2pcs, UNF 7/8 x 2pcs) | |
| System Components | ③ | NH06-SS-XX (Hose meter) NH10-78-XX (Hose meter) | 3/8" Hose with 2pcs of PF 3/8" hose coupling on both ends 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | P. 27 |
| | ④ | Tiller Arm (ST911-19T) | To convert the motion of cylinder into the motion of the rudder stock | P. 34 |
| | ⑤ | Steering Wheel | From ø600mm up to ø1200mm. SW2-60W, SW2-70W, SW2-80W is for NHP070T | P. 33 |
| | ⑥ | Ball Joint | To install the mechanical tie bar on the tiller arm | P. 35 |
| | No Number | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | RMF38 | Remote oil filling kit | P. 31 |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | Dual station kit | To add an additional station of helm pump | P. 18 |

All components sold in optional & being packed separately

Dimension Requirement for Installation



| Model | A | B | C | D | E | F | G | H | H' | I | J | K | L | M | N | O |
|---------|-----|----|-----|-----|-----|----|-----|-----|-----|-----|-----|----|------|----|--------|-------|
| IOC5025 | 609 | 70 | 138 | 106 | 114 | 62 | 115 | 199 | - | 346 | 398 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 |
| IOC5026 | 685 | 70 | 188 | 142 | 114 | 62 | 115 | - | 243 | 346 | 397 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 |
| IOC6325 | 612 | 78 | 127 | 85 | 156 | 72 | 127 | 199 | - | 346 | 398 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 |
| IOC6326 | 688 | 78 | 177 | 121 | 156 | 72 | 127 | - | 243 | 346 | 397 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 |

Hydraulic Steering for Twin Rudder Boat

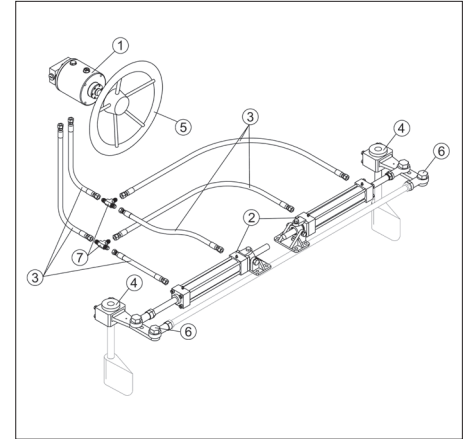
IOC type - two cylinders

Using mechanical tie bar (Non-supply)

Application Guide

| Model | System Basic Components | | Hose | Wheel Turn | Torque | Applicable |
|----------------|-------------------------|----------------|---------|--------------|---------|------------|
| | Cylinder | Helm Pump | Size | Lock to Lock | kgf.m | Engine HP |
| MI150H-70-T2M | IOC5025 x 2 | NHP070(T or S) | 3/8" or | 9.6 | 151 x 2 | 250hp x 2 |
| MI190H-70-T2M | IOC5026 x 2 | NHP070(T or S) | 5/8" | 11.6 | 185 x 2 | 250hp x 2 |
| MI270H-90-T2M | IOC6325 x 2 | NHP090S | 5/8" | 13.2 | 270 x 2 | 250hp x 2 |
| MI330H-120-T2M | IOC6326 x 2 | NHP120S | | 12.2 | 329 x 2 | 350hp x 2 |

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree

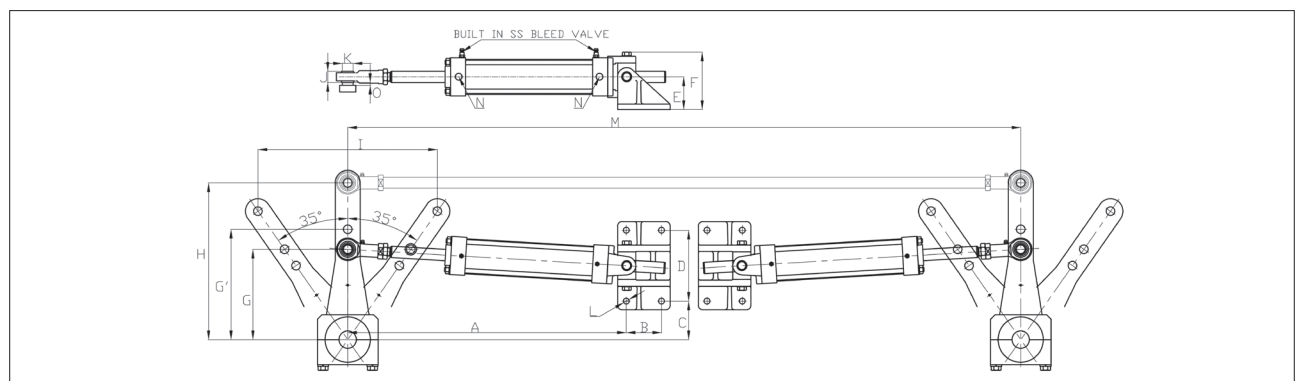


Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|--------------------------|---|----------|
| System Basic Components | ① | NHP070(T or S) Helm pump | Helm Pump with fittings (PF 3/8 x 2pcs, UNF 7/8 x 2pcs) | P. 22-23 |
| | | | Two types of shaft (Taper 3/4" shaft or Straight 1" shaft) | |
| | | NHP090S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) | |
| | | | Straight 1" shaft | |
| | ② | NHP120S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) | P. 24 |
| | | | Straight 1" shaft | |
| System Components | ③ | IOC5025~6326 | IOC Cylinder with two types of fittings (PF 3/8 x 2pcs, UNF 7/8 x 2pcs) | P. 27 |
| | ④ | NH06-SS-XX (Hose meter) | 3/8" Hose with 2pcs of PF 3/8" hose coupling on both ends | P. 34 |
| | ⑤ | NH10-78-XX (Hose meter) | 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | P. 33 |
| | ⑥ | Tiller Arm (ST911-19T) | To convert the motion of cylinder into the motion of the rudder stock | P. 35 |
| | ⑦ | Steering Wheel | From ø600mm up to ø1200mm. SW2-60W, SW2-70W, SW2-80W is for NHP070T | P. 29 |
| | ⑧ | Ball Joint | To install the mechanical tie bar on the tiller arm | P. 31 |
| | ⑨ | T Fitting | To connect the hoses | P. 31 |
| | No Number | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 36 |
| | | RMF38 | Remote oil filling kit | P. 18 |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | |
| | | Dual station kit | To add an additional station of helm pump | |

All components sold in optional & being packed separately

Dimension Requirement for Installation



| Model | A | B | C | D | E | F | G | G' | H | I | J | K | L | M | N | O |
|---------|-----|----|-----|-----|----|-----|-----|-----|-----|-----|----|------|----|------|--------|-------|
| IOC5025 | 609 | 70 | 106 | 114 | 62 | 115 | 199 | - | 346 | 398 | 25 | 19.1 | 13 | 1511 | PT 3/8 | MIN 6 |
| IOC5026 | 685 | 70 | 142 | 114 | 62 | 115 | - | 243 | 346 | 397 | 25 | 19.1 | 13 | 1713 | PT 3/8 | MIN 6 |
| IOC6325 | 612 | 78 | 85 | 156 | 72 | 127 | 199 | - | 346 | 398 | 25 | 19.1 | 13 | 1526 | PT 3/8 | MIN 6 |
| IOC6326 | 688 | 78 | 121 | 156 | 72 | 127 | - | 243 | 346 | 397 | 25 | 19.1 | 13 | 1753 | PT 3/8 | MIN 6 |

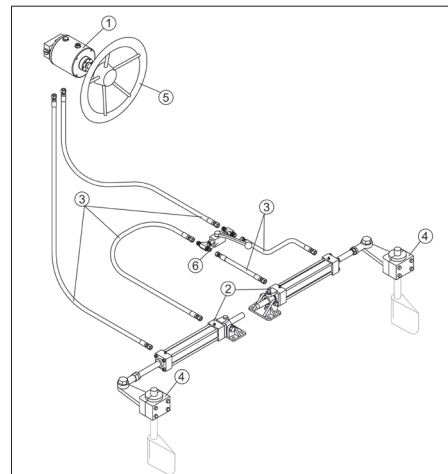
Hydraulic Steering for Twin Rudder Boat

IOC type - two cylinders

Using Liquid Tie bar alignment valve (for Catamaran)

Application Guide

| Model | System Basic Components | | Hose | Wheel Turn |
|----------------|-------------------------|----------------|--------------------|--------------|
| | Cylinder | Helm Pump | Size | Lock to Lock |
| MI120H-70-T2L | IOC5024 x 2 | NHP070(T or S) | 3/8" or 5/8" | 3.7 |
| MI150H-70-T2L | IOC5025 x 2 | NHP070(T or S) | | 4.8 |
| MI190H-70-T2L | IOC5026 x 2 | NHP070(T or S) | | 5.8 |
| MI270H-90-T2L | IOC6325 x 2 | NHP090S | 5/8" | 6.6 |
| MI330H-120-T2L | IOC6326 x 2 | NHP120S | | 6.1 |

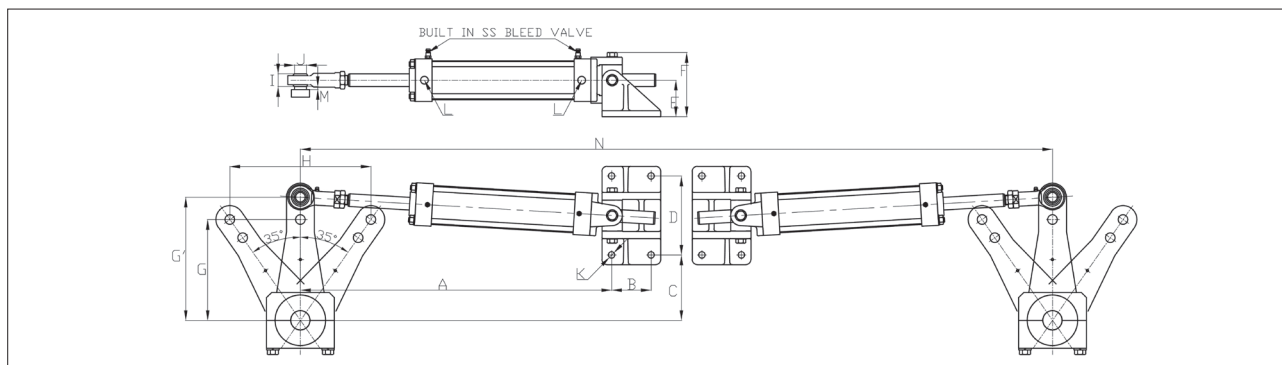


Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|--|---|----------|
| System Basic Components | ① | NHP070(T or S) Helm pump | Helm Pump with fittings (PF 3/8 x 2pcs, UNF 7/8 x 2pcs) Two types of shaft (Taper 3/4" shaft or Straight 1" shaft) | P. 22-23 |
| | | NHP090S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) Straight 1" shaft | |
| | | NHP120S Helm pump | Helm Pump with fittings (UNF 7/8 x 2pcs) Straight 1" shaft | |
| | | | | |
| System Components | ② | IOC5024~6326 | IOC Cylinder with two types of fittings(PF 3/8 x 2pcs, UNF 7/8 x 2pcs) | P. 24 |
| | ③ | NH06-SS-XX (Hose meter) NH10-78-XX (Hose meter) | 3/8" Hose with 2pcs of PF 3/8" hose coupling on both ends 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | P. 27 |
| | ④ | Tiller Arm | To convert the motion of cylinder into the motion of the rudder stock | P. 34 |
| | ⑤ | Steering Wheel | From ø600mm up to ø1200mm. SW2-60W, SW2-70W, SW2-80W is for NHP070T | P. 33 |
| | ⑥ | Liquid Tie Bar Alignment Valve | In case mechanical tie bar can not be used, allow for realign of two rudders | P. 32 |
| | No Number | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | RMF38 | Remote oil filling kit | P. 31 |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | Dual station kit | To add an additional station of helm pump | P. 18 |

All components sold in optional & being packed separately

Dimension Requirement for Installation



| Model | A | B | C | D | E | F | G | G' | H | I | J | K | L | M | N |
|---------|-----|----|-----|-----|----|-----|-----|-----|-----|----|------|----|--------|-------|------|
| IOC5024 | 531 | 70 | 70 | 114 | 62 | 115 | - | 155 | 178 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 | 1307 |
| IOC5025 | 610 | 70 | 106 | 114 | 62 | 115 | 199 | - | 280 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 | 1511 |
| IOC5026 | 686 | 70 | 142 | 114 | 62 | 115 | - | 243 | 279 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 | 1713 |
| IOC6325 | 688 | 78 | 85 | 156 | 72 | 127 | 199 | - | 280 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 | 1526 |
| IOC6326 | 688 | 78 | 121 | 156 | 72 | 127 | - | 243 | 279 | 25 | 19.1 | 13 | PT 3/8 | MIN 6 | 1753 |

Hydraulic Steering for Twin Rudder Boat

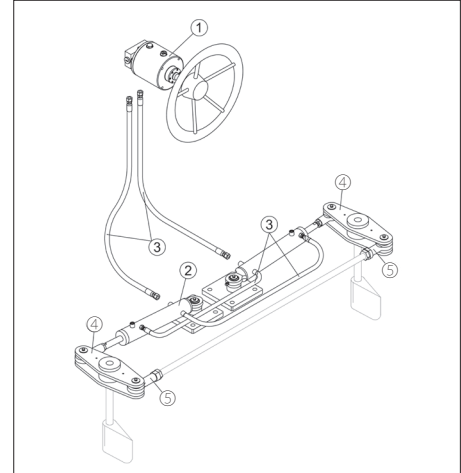
UDC type - two cylinders

Using mechanical tie bar (Non-supply)

Application Guide

| Model | System Basic Components | | Hose | Wheel Turn | Torque | Applicable |
|----------------|-------------------------|-----------|------|--------------|---------|------------|
| | Cylinder | Helm Pump | Hose | Lock to Lock | kgf.m | Engine HP |
| MU260H-90-T2M | UDC5030DS x 2 | NHP090S | 5/8" | 7.2 | 130 x 2 | 125hp x 2 |
| MU480H-120-T2M | UDC6335DS x 2 | NHP120S | | 10.1 | 242 x 2 | 200hp x 2 |
| MU660H-120-T2M | UDC7040DS x 2 | NHP120S | | 13.6 | 327 x 2 | 250hp x 2 |

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree

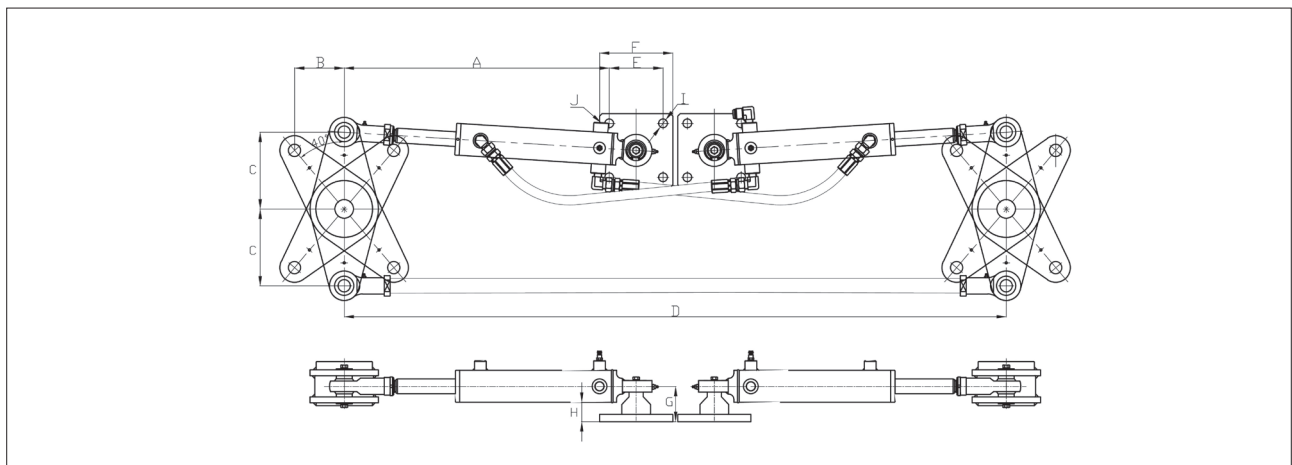


Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|-------------------------|---|----------|
| System Basic Components | ① | NHP090S~120S | Helm pump with fittings(UNF 7/8 x 2pcs), Straight 1" Shaft | P. 22-23 |
| | ② | UDC5030DS~7040DS | UDC Cylinder with fittings (UNF 7/8 x 2pcs) | P. 26 |
| System Components | ③ | NH10-78-XX (Hose meter) | 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | P. 27 |
| | ④ | Tiller Arm | To convert the motion of cylinder into the motion of the rudder stock | P. 35 |
| | ⑤ | Ball Joint | To install the mechanical tie bar on the tiller arm | P. 35 |
| | No Number | Steering Wheel | From ø600mm up to ø1200mm | - |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | RMF38 | Remote oil filling kit | P. 31 |
| | | Dual station kit | To add an additional station of helm pump | P. 18 |

All components sold in optional & being packed separately

Dimension Requirement for Installation



| Model | A | B | C | D | E | F | G | H | I | J |
|-----------|-----|-------|-----|------|-----|-----|----|------|----|--------|
| UDC5030DS | 541 | 101.5 | 157 | 1350 | 110 | 150 | 72 | 39.5 | 18 | PT 1/2 |
| UDC6335DS | 580 | 114.5 | 178 | 1430 | 110 | 150 | 72 | 34 | 18 | PT 1/2 |
| UDC7040DS | 630 | 127 | 197 | 1570 | 130 | 170 | 73 | 33 | 18 | PT 1/2 |

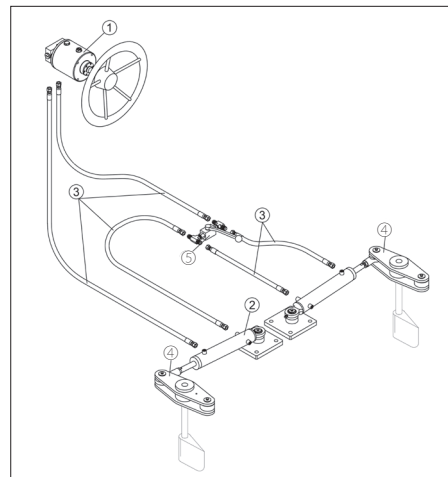
Hydraulic Steering for Twin Rudder Boat

UDC type - two cylinders

Using Liquid Tie bar alignment valve (for Catamaran)

Application Guide

| Model | System Basic Components | | Hose | Wheel Turn |
|----------------|-------------------------|-----------|------|--------------|
| | Cylinder | Helm Pump | Hose | Lock to Lock |
| MU260H-90-T2L | UDC5030DS x 2 | NHP090S | 5/8" | 3.6 |
| MU480H-120-T2L | UDC6335DS x 2 | NHP120S | | 5.0 |
| MU660H-120-T2L | UDC7040DS x 2 | NHP120S | | 6.8 |

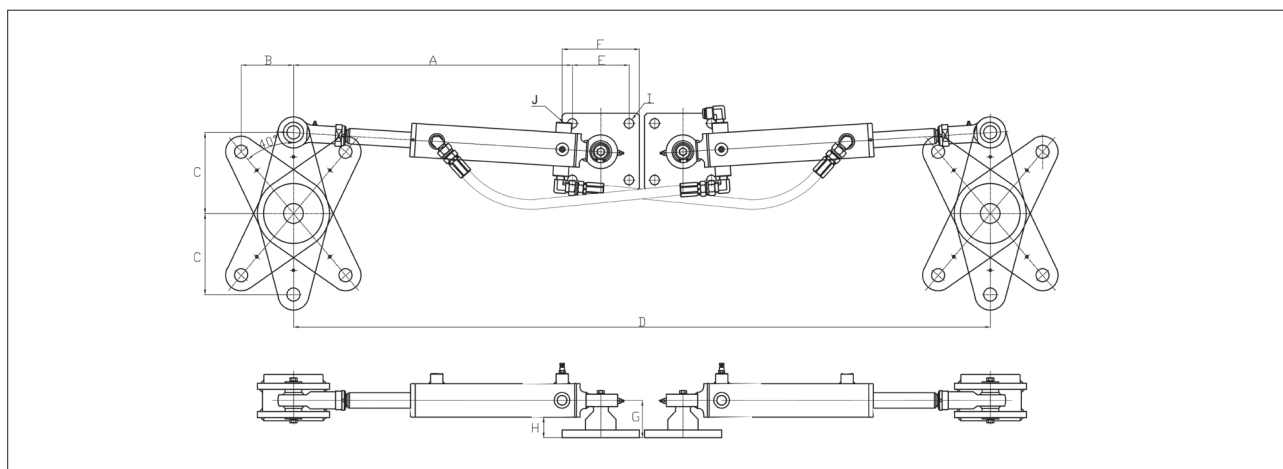


Components

| Supply type | No. | Components | Description | Ref Page |
|-------------------------|-----------|--|--|----------|
| System Basic Components | ① | NHP090S~120S | Helm pump with fittings(UNF 7/8 x 2pcs), Straight 1" Shaft | P. 22-23 |
| | ② | UDC5030DS~7040DS | UDC Cylinder with fittings (UNF 7/8 x 2pcs) | P. 26 |
| System Components | ③ | NH10-78-XX (Hose meter) | 5/8" Hose with 2pcs of UNF 7/8" hose coupling on both ends | P. 27 |
| | ④ | Tiller Arm | To convert the motion of cylinder into the motion of the rudder stock | P. 35 |
| | ⑤ | Liquid Tie Bar Alignment Valve(BPV-78) | In case mechanical tie bar can not be used, allow for realign of two rudders | P. 32 |
| | No Number | Steering Wheel | From ø600mm up to ø1200mm | - |
| | | SF-OIL-15 | ISO VG 15 oil 1 liter | P. 31 |
| | | RMF38 | Remote oil filling kit | P. 31 |
| | | Rudder Angle Indicator | To indicate the present position of rudder blade | P. 36 |
| | | Dual station kit | To add an additional station of helm pump | P. 18 |

All components sold in optional & being packed separately

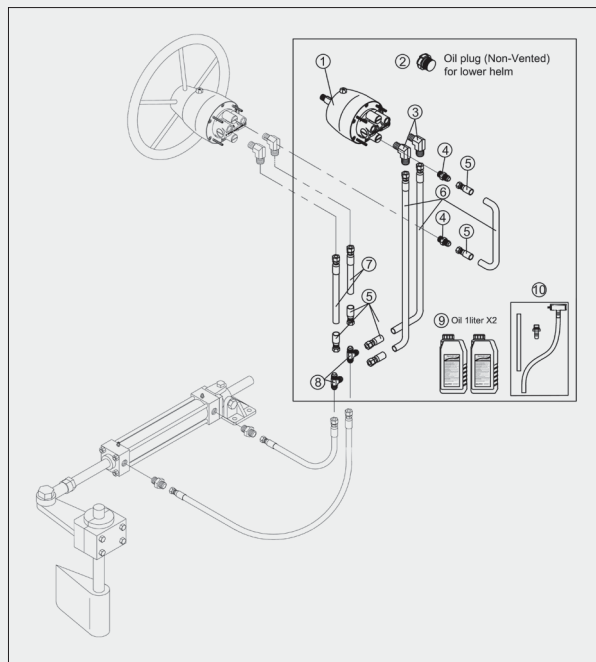
Dimension Requirement for Installation



| Model | A | B | C | D | E | F | G | H | I | J |
|-----------|-----|-------|-----|------|-----|-----|----|------|----|--------|
| UDC5030DS | 541 | 101.5 | 157 | 1350 | 110 | 150 | 72 | 39.5 | 18 | PT 1/2 |
| UDC6335DS | 580 | 114.5 | 178 | 1430 | 110 | 150 | 72 | 34 | 18 | PT 1/2 |
| UDC7040DS | 630 | 127 | 197 | 1570 | 130 | 170 | 73 | 33 | 18 | PT 1/2 |

Dual Station

NSH Type helm pump

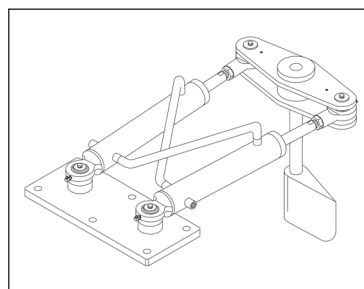
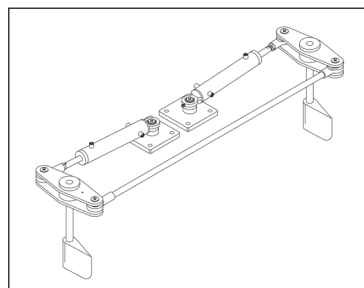
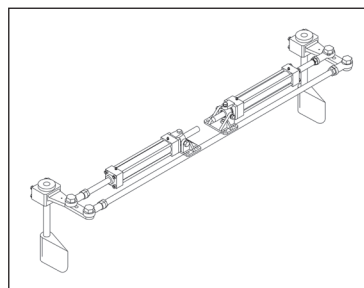
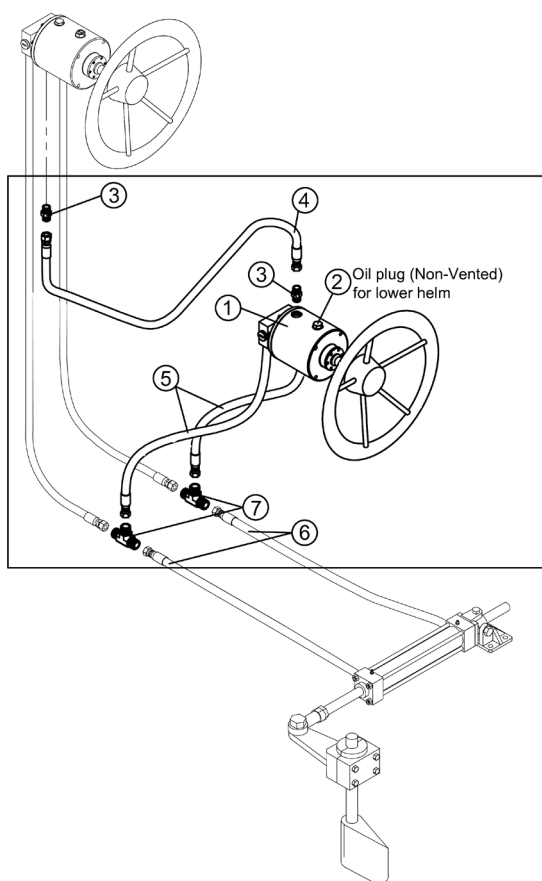


* Dual station of NSH helm pump can also be used for boats that use one cylinder for twin rudders.
* It is sold as a hydraulic steering package.

| NO. | COMPONENTS | Dual Station 3/8 DHK-38-XX | Q'ty |
|-----|---------------------------|----------------------------|------|
| 1 | HELM PUMP | NSH XXX | 1 |
| 2 | CAP (Non-vented) | C1800803 | 1 |
| 3 | ELBOW FITTING (O-RING) | HLO14N0S | 2 |
| 4 | STRAIGHT FITTING (O-RING) | HS014N0 | 2 |
| 5 | REUSABLE HOSE COUPLING | C3520149 | 6 |
| 6 | HOSE-30M | NH06-SS-30 | 1 |
| 7 | HOSE-4M | NH06-SS-04 | 1 |
| 8 | TEE FITTING | HTN300 | 2 |
| 9 | OIL 1 LITER | SF OIL 15 | 2 |
| 10 | OIL FILLING KIT | OAK 300 | 1 |

Dual Station

NHP Type helm pump



* Dual station of NHP helm pump can also be used for boats that use one/two cylinders and mechanical/liquid tie bar for twin rudders.

* All products are sold at option & being packed separately

Components Needful for Dual Stations

NHP070(T or S) (3/8" Hose system)

| NO. | Components | Model | Q'ty |
|-----|---------------------------|----------------|------|
| 1 | HELM PUMP | NHP070(T or S) | 1 |
| 2 | CAP | C3060153 | 1 |
| 3 | Straight Fitting (O-RING) | HS038N | 2 |
| 4 | Hose | NH06-SS-XX | 1 |
| 5 | Hose | NH06-SS-XX | 2 |
| 6 | Hose | NH06-SS-XX | 2 |
| 7 | Tee fitting | HTN300 | 2 |
| | Oil 1 liter bottle | SF-OIL-15 | ** |

NHP070(T or S), NHP090S, NHP120S (5/8" Hose system)

| NO. | Components | Model | Q'ty |
|-----|---------------------------|-------------------------------|------|
| 1 | HELM PUMP | NHP070(T or S), NHP090S, 120S | 1 |
| 2 | CAP | C3060153 | 1 |
| 3 | Straight Fitting (O-RING) | HS038E | 2 |
| 4 | Hose | NH10-78-XX | 1 |
| 5 | Hose | NH10-78-XX | 2 |
| 6 | Hose | NH10-78-XX | 2 |
| 7 | Tee fitting | HT78EE | 2 |
| | Oil 1 liter bottle | SF-OIL-15 | ** |

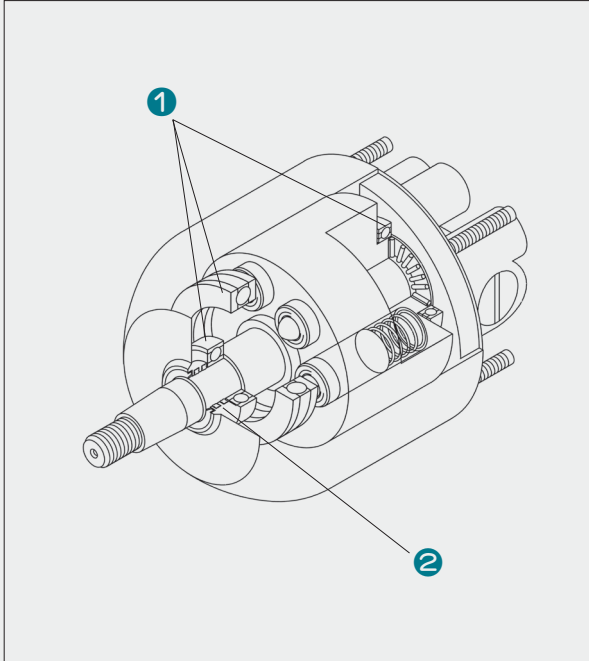
*** Please specify the quantity of oil before ordering

HYDRAULIC STEERING COMPONENTS



NSH Type helm pump

NSH Type



Features

- ❶ Three ball bearings supporting the rotor, which makes the helm pump be used for heavy duty use.
- ❷ Two shaft seals and one dust wiper (Three sealing system)
- ❸ Vented oil plug has the function of releasing pressure generated from inside the pump
- ❹ SS 304 shaft

- Maximum durability
- Fixed displacement
- Lock Valve Inbuilt
- Mounting Hardware and steering wheel mounting hardware supplied as standard
- Interconnecting ports (black plugs) for dual station of steering.
- Common dash hole mount for easy replacement with other brand

Hydraulic Steering Components

NSH Type helm pump

ORDER GUIDE

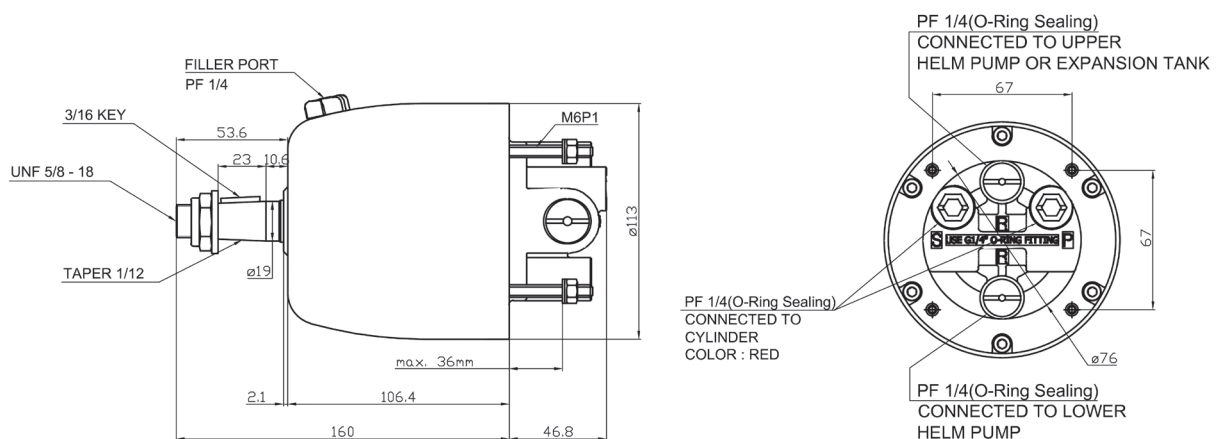
| Model | Displacement | | Shaft | Key | Lock valve | Port size |
|--------|--------------|------------|---------------------|--------------|------------|-----------|
| | cc / rev | cu.in/ rev | | | | |
| NSH018 | 18 | 1.09 | Taper on 3/4" shaft | 3/16" square | Built-in | PF1/4 |
| NSH022 | 22 | 1.34 | | | | |
| NSH025 | 25 | 1.52 | | | | |
| NSH030 | 30 | 1.83 | | | | |
| NSH037 | 37 | 2.25 | | | | |
| NSH044 | 44 | 2.68 | | | | |

Optional parts for NSH helm pump

| | | | |
|----------|------------------------|----------------|----------------|
| SHB-100 | 20 degree wedge | Ref to page.33 | Optional parts |
| SHB-200 | 20 degree wedge | Ref to page.33 | |
| C1800803 | Oil Plug (Non-Vented) | Ref to page.32 | |

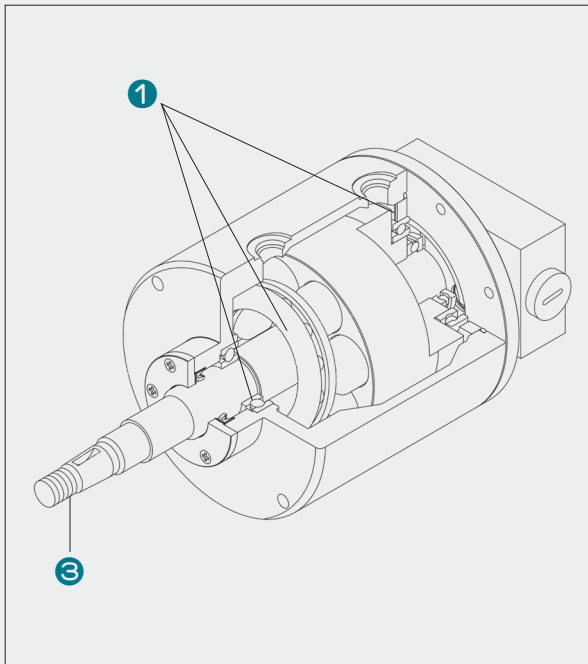
- NSH Helm pump always comes with Vented Plug (Parts Number : C1800802) and Elbow fittings (PF3/8)
- Non-Vented Plug (Parts Number : C1800803) optionally available to be used on lower helm pump.
- Max steering wheel diameter for NSH Helm pump : Diameter $\varnothing 400\text{mm}$
- Use Seafirst hydraulic oil for the best performance (Ref to page.31)

DIMENSION



NHP Type helm pump

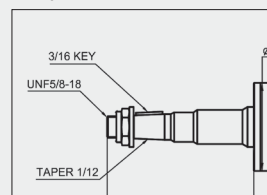
NHP Type



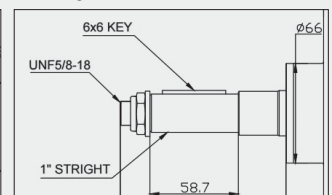
Features

- ❶ Three ball bearings supporting the rotor, which make the helm pump be used for heavy duty use.
- ❷ Vented oil plug has the function of releasing pressure generated from inside the pump
- ❸ SS 304 shaft NHP070(T or S) – Taper $\frac{3}{4}$ " Shaft OR Straight 1" Shaft
 NHP090S – Straight 1" Shaft
 NHP120S – Straight 1" Shaft

• Taper $\frac{3}{4}$ " Shaft



• Straight 1" Shaft



- Maximum durability
- Fixed displacement
- Lock Valve Inbuilt
- Mounting Hardware and steering wheel mounting hardware supplied as standard
- Interconnecting ports (black plugs) for dual station of steering.

Hydraulic Steering Components

NHP Type helm pump

ORDER GUIDE

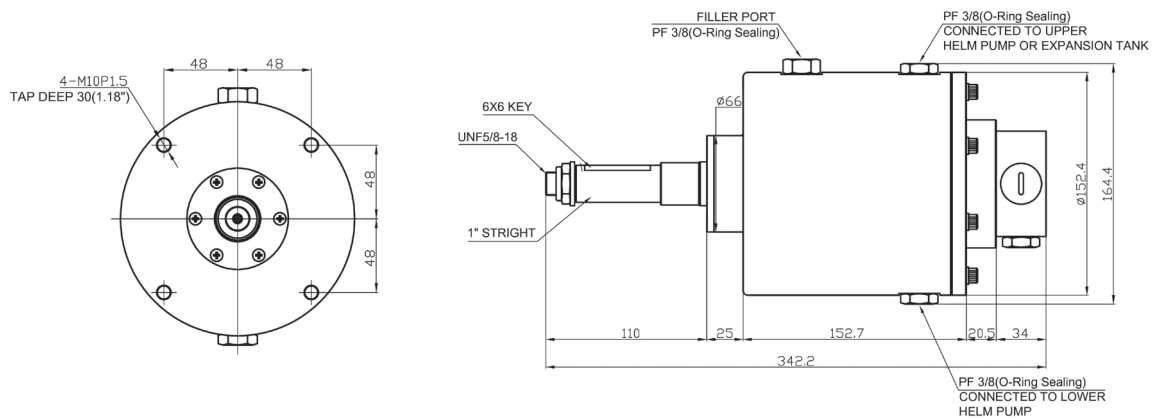
| Model | Displacement | | Shaft | Key | Lock valve | Port Thread |
|---------|--------------|------------|-------------------|----------------|------------|-------------|
| | cc / rev | cu.in/ rev | | | | |
| NHP070T | 70 | 4.3 | Taper ¾" Shaft | 3/16" square | Built-in | PF 3/8 |
| NHP070S | 70 | 4.3 | Straight 1" Shaft | 6 x 6 x 45(mm) | | |
| NHP090S | 90 | 5.5 | Straight 1" Shaft | 6 x 6 x 45(mm) | | |
| NHP120S | 120 | 7.3 | Straight 1" Shaft | 6 x 6 x 45(mm) | | |

Optional parts for NHP helm pump

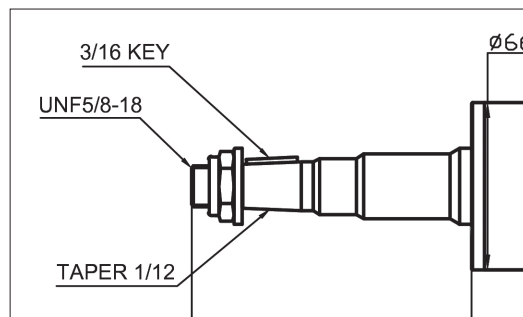
| | | | |
|----------|-----------------------|----------------|----------------|
| RMF 38 | Remote Oil fill kit | Ref to page.31 | Optional parts |
| C3060153 | Oil Plug (Non-Vented) | Ref to page.32 | |

- NHP Helm pump always comes with Vented Plug (Parts Number : C3060802)
- NHP070(T or S) Helm pump includes 4pcs x Straight fittings (PF3/8" x 2 pcs and UNF7/8" x 2pcs)
NHP090S, 120S Helm pump includes 2pcs x Straight fittings (UNF7/8" x 2pcs)
- Max steering wheel diameter for NHP Helm pump : Diameter Ø1200mm
- Use Seafirst hydraulic oil for the best performance (Ref to the page. 31)

DIMENSION

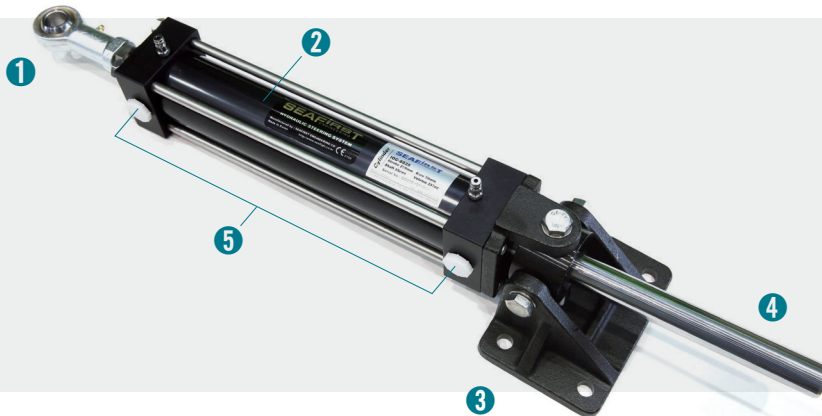


- Taper ¾" Shaft for NHP070T



Hydraulic Steering Components

IOC Type Cylinder



Features

- ❶ Stainless Steel
- ❷ Aluminum with anodized
- ❸ Brass, Black Color
- ❹ Stainless steel, chrome plated
- ❺ Straight fittings included

IOC4020~4022 : PF3/8 x 2pcs

IOC5024~6326 : PF3/8 x 2pcs and UNF7/8 x 2pcs

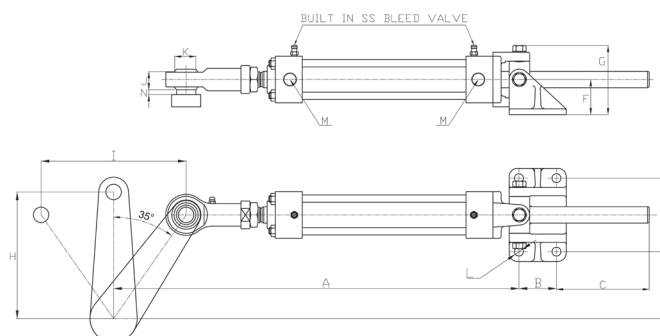
ORDER GUIDE

| Cylinder | Bore | Stroke | Shaft | Oil Volume | Torque | | Port Thread |
|----------|------|--------|-------|------------|-------------------------|-------------------------|-------------|
| | | mm | mm | | At 40kg/cm ² | At 63kg/cm ² | |
| IOC4020 | 40 | 127 | 20 | 120 | 34 | 54 | PT 3/8 |
| IOC4021 | 40 | 178 | 20 | 168 | 48 | 75 | |
| IOC4022 | 40 | 229 | 20 | 215 | 61 | 97 | |
| IOC5024 | 50 | 178 | 25 | 262 | 75 | 118 | |
| IOC5025 | 50 | 229 | 25 | 337 | 96 | 151 | |
| IOC5026 | 50 | 279 | 25 | 411 | 117 | 185 | |
| IOC6325 | 63 | 229 | 25 | 600 | 171 | 270 | |
| IOC6326 | 63 | 279 | 25 | 734 | 209 | 329 | |

* Torque : Max Torque from cylinder at pressure 40 or 63kg/cm² and 35 degree

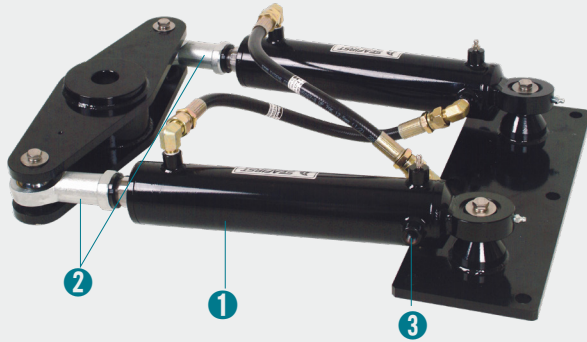
DIMENSION

| Model | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---------|-----|----|-----|-----|-----|----|-----|-----|-----|----|------|----|--------|-------|
| IOC4020 | 413 | 46 | 64 | 46 | 90 | 43 | 84 | 111 | 127 | 22 | 19.1 | 11 | PT 3/8 | Min 6 |
| IOC4021 | 490 | 46 | 115 | 82 | 90 | 43 | 84 | 155 | 178 | 22 | 19.1 | 11 | PT 3/8 | Min 6 |
| IOC4022 | 566 | 46 | 166 | 118 | 90 | 43 | 84 | 199 | 229 | 22 | 19.1 | 11 | PT 3/8 | Min 6 |
| IOC5024 | 534 | 70 | 85 | 70 | 114 | 62 | 114 | 155 | 178 | 22 | 19.1 | 13 | PT 3/8 | Min 6 |
| IOC5025 | 610 | 70 | 136 | 106 | 114 | 62 | 114 | 199 | 229 | 22 | 19.1 | 13 | PT 3/8 | Min 6 |
| IOC5026 | 685 | 70 | 187 | 142 | 114 | 62 | 114 | 243 | 279 | 22 | 19.1 | 13 | PT 3/8 | Min 6 |
| IOC6325 | 613 | 78 | 126 | 85 | 156 | 72 | 127 | 199 | 229 | 22 | 19.1 | 13 | PT 3/8 | Min 6 |
| IOC6326 | 688 | 78 | 177 | 121 | 156 | 72 | 127 | 243 | 279 | 22 | 19.1 | 13 | PT 3/8 | Min 6 |



Hydraulic Steering Components

UDC Type Cylinder - Single rudder



Features

- ❶ Heavy Duty double cylinder
- ❷ Hard chrome plated shaft
- ❸ Elbow fittings included UNF7/8 x 2pcs

* Max pressure : 120kg/cm²

ORDER GUIDE

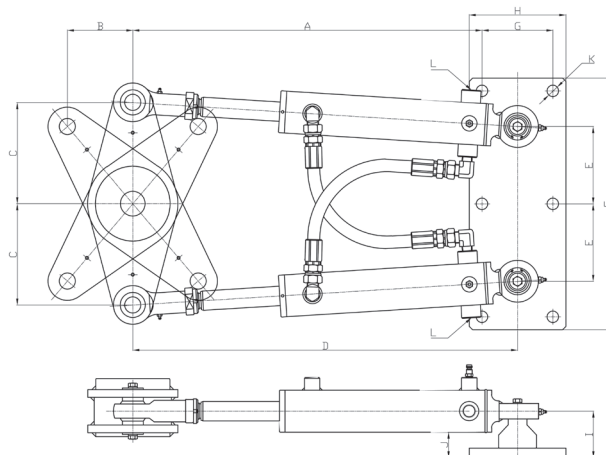
| Cylinder | Bore | | Shaft | | Stroke | | Oil Volume | | Torque | | Port Thread |
|----------|------|------|-------|------|--------|------|------------|-------|--------|--------|-------------|
| | mm | inch | mm | inch | mm | inch | cc | Cu.in | Kgf.m | lbf.ft | |
| UDC5030S | 50 | 1.96 | 30 | 1.18 | 203 | 8 | 654 | 39.90 | 261 | 1888 | PT ½ |
| UDC6335S | 63 | 2.48 | 35 | 1.37 | 229 | 9 | 1207 | 73.65 | 484 | 3500 | |
| UDC7040S | 70 | 2.75 | 40 | 1.57 | 254 | 10 | 1636 | 99.83 | 655 | 4737 | |

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree

DIMENSION

| Model | A | B | C | D | E | F | G | H | I | J | K | L |
|----------|-----|-------|-----|-----|-----|-----|-----|-----|----|------|----|------|
| UDC5030S | 541 | 101.5 | 157 | 596 | 175 | 390 | 110 | 150 | 72 | 39.5 | 18 | PT ½ |
| UDC6335S | 580 | 114.5 | 178 | 635 | 191 | 423 | 110 | 150 | 72 | 34 | 18 | |
| UDC7040S | 630 | 127 | 197 | 696 | 215 | 470 | 130 | 170 | 73 | 33 | 18 | |

Dimension : mm



Hydraulic Steering Components

UDC Type Cylinder - Twin Rudders



Features

- ❶ Heavy Duty double cylinder
- ❷ Hard chrome plated shaft
- ❸ Elbow fittings included UNF7/8 x 2pcs

* Max pressure : 120kg/cm²

ORDER GUIDE

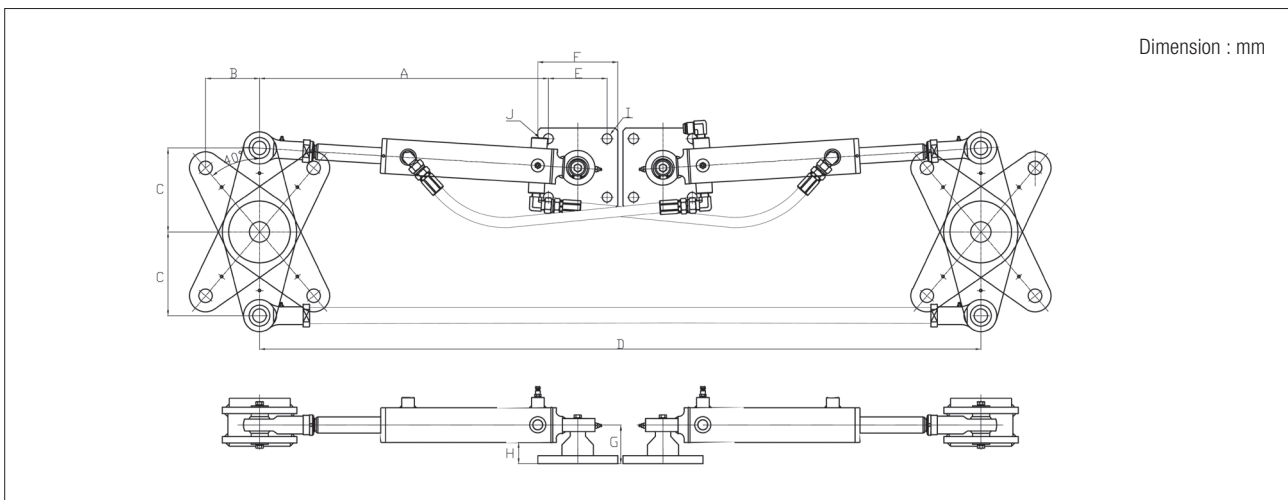
| Cylinder | Bore | | Shaft | | Stroke | | Oil Volume | | Torque | | Port Thread |
|-----------|------|------|-------|------|--------|------|------------|-------|--------|--------|-------------|
| | mm | inch | mm | inch | mm | inch | cc | Cu.in | Kgf.m | lbf.ft | |
| UDC5030DS | 50 | 1.96 | 30 | 1.18 | 203 | 8 | 654 | 39.90 | 261 | 1888 | PT ½ |
| UDC6335DS | 63 | 2.48 | 35 | 1.37 | 229 | 9 | 1207 | 73.65 | 484 | 3500 | |
| UDC7040DS | 70 | 2.75 | 40 | 1.57 | 254 | 10 | 1636 | 99.83 | 655 | 4737 | |

* Oil volume : based on 2units of UDC-DS cylinders

* Torque : Max Torque from cylinder at pressure 63kg/cm² and 35 degree for all unbalanced cylinders

DIMENSION

| Model | A | B | C | D | E | F | G | H | I | J |
|-----------|-----|-------|-----|------|-----|-----|----|------|----|------|
| UDC5030DS | 541 | 101.5 | 157 | 1350 | 110 | 150 | 72 | 39.5 | 18 | PT ½ |
| UDC6335DS | 580 | 114.5 | 178 | 1430 | 110 | 150 | 72 | 34 | 18 | |
| UDC7040DS | 630 | 127 | 197 | 1570 | 130 | 170 | 73 | 33 | 18 | |



Hydraulic Steering Components

Hose & Hose Coupling

HOSE (Pre-assembled hose coupling)



| Part Number | Description | Hose Coupling | Hose Size | Recommend |
|-------------|-------------|---------------|-----------|-------------------------------|
| NH06-SS-01 | 100R-06 1M | G(PF)3/8 | 3/8" | MI-N MI-H (with NHP070) |
| NH06-SS-02 | 100R-06 2M | G(PF)3/8 | 3/8" | |
| NH06-SS-03 | 100R-06 3M | G(PF)3/8 | 3/8" | |
| NH06-SS-04 | 100R-06 4M | G(PF)3/8 | 3/8" | |
| NH06-SS-05 | 100R-06 5M | G(PF)3/8 | 3/8" | |
| NH06-SS-06 | 100R-06 6M | G(PF)3/8 | 3/8" | |
| NH06-SS-07 | 100R-06 7M | G(PF)3/8 | 3/8" | |
| NH06-SS-08 | 100R-06 8M | G(PF)3/8 | 3/8" | |
| NH06-SS-09 | 100R-06 9M | G(PF)3/8 | 3/8" | |
| NH06-SS-10 | 100R-06 10M | G(PF)3/8 | 3/8" | |

| Part Number | Description | Hose Coupling | Hose Size | Recommend |
|-------------|-------------|---------------|-----------|--------------|
| NH10-78-01 | 100R-10 1M | UNF 7/8" | 5/8" | MI-H MU-H |
| NH10-78-02 | 100R-10 2M | UNF 7/8" | 5/8" | |
| NH10-78-03 | 100R-10 3M | UNF 7/8" | 5/8" | |
| NH10-78-04 | 100R-10 4M | UNF 7/8" | 5/8" | |
| NH10-78-05 | 100R-10 5M | UNF 7/8" | 5/8" | |
| NH10-78-06 | 100R-10 6M | UNF 7/8" | 5/8" | |
| NH10-78-07 | 100R-10 7M | UNF 7/8" | 5/8" | |
| NH10-78-08 | 100R-10 8M | UNF 7/8" | 5/8" | |
| NH10-78-09 | 100R-10 9M | UNF 7/8" | 5/8" | |
| NH10-78-10 | 100R-10 10M | UNF 7/8" | 5/8" | |

- Specify hose length if you want a different length of hose.
- Pre-assembled hose connectors on both ends Swaged type

Roll Hose



| Part Number | Description | Hose Size |
|-------------|-------------|-----------|
| NH06 | 100M | 3/8" |
| NH10 | 100M | 5/8" |

HOSE COUPLING



SF-PF-06-14-S / SK-UN-10-14



C3520149

| Part Number | Spec | Material | Suitable Hose | Remark |
|---------------|------------|-----------------|---------------|--------------------------|
| SF-PF-06-14-S | G(PF) 3/8" | Stainless Steel | 3/8" (NH06) | Swaging Type |
| C3520149 | G(PF) 3/8" | Brass | 3/8" (NH06) | Reusable (Screw in) Type |
| SK-UN-10-14 | UNF 7/8" | Steel | 5/8" | Swaging Type |

Hydraulic Steering Components

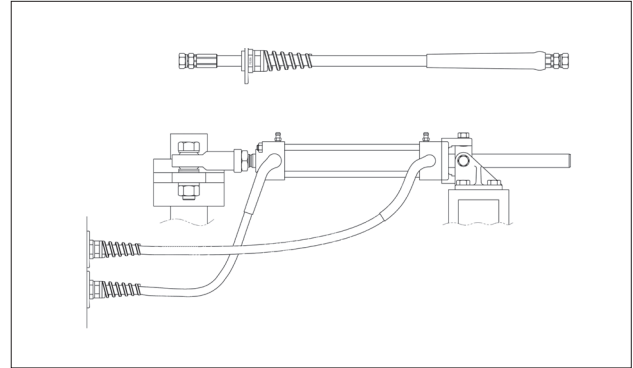
Bulkhead Mounting Kit

Bulkhead Mounting Plate

| Part Number | Description | Suitable Hose |
|-------------|-------------------------|---------------|
| BMK16 | Bulkhead Mounting Plate | NH06 (3/8") |

• Caution

- * BMK16 must be pre-assembled to the hose prior to assembling the hose coupling
- * If you need a hose with BMK16, add "B" on part number of hose kit. For example, NH06-SS-06B : 6meter hose kit with Bulkhead Mounting Plate



Bulkhead Mounting Plate - Adjustable

| Part Number | Description | Suitable Hose |
|-------------|-----------------------|---------------|
| BMK100 | Bulkhead Mounting Kit | NH06 (3/8") |
| BMK200 | | |

• Benefit

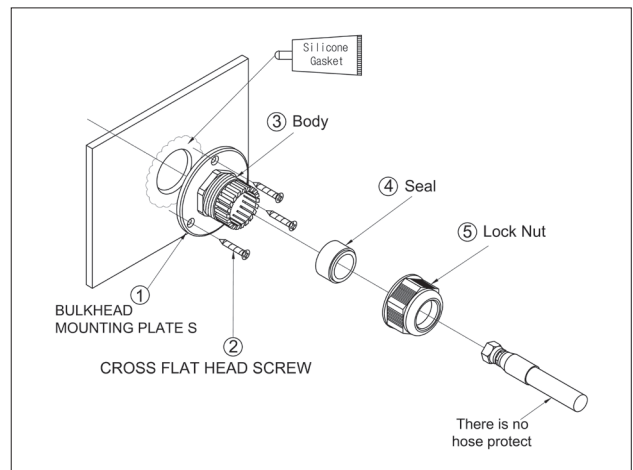
BMK100 and BMK200 can be used regardless of whether hose coupling is assembled to the hose.



BMK100

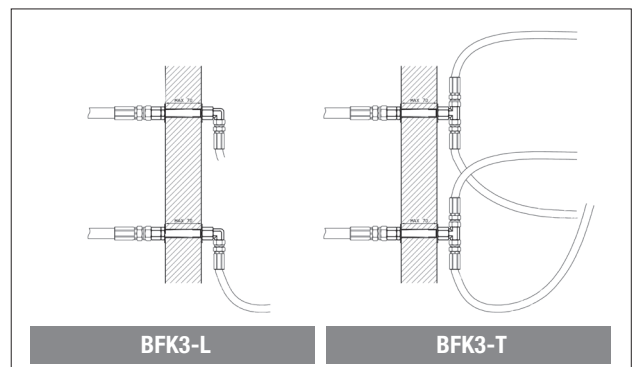


BMK200



Bulkhead Mounting Fitting Kit

| Part Number | Description | Suitable Hose |
|-------------|----------------------------------|---------------|
| BFK3-L | Bulkhead Fitting (Elbow fitting) | NH06 (3/8") |
| BFK3-T | Bulkhead Fitting (T fitting) | NH06 (3/8") |




BFK3-L

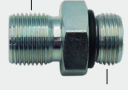
BFK3-T


Hydraulic Steering Components

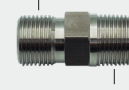
Fitting


STRAIGHT FITTING

| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HS014NS |
| DESCRIPTION | STRAIGHT FITTING |
| APPLICATION | PF1/4 (O-RING) X PF3/8 |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NSH Helm pump with NH06 hose |


| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HS038N |
| DESCRIPTION | STRAIGHT FITTING |
| APPLICATION | PF3/8 (O-RING) X PF3/8, STEEL |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NHP helm pump with NH06 hose |


| | |
|--|--------------------------------|
|  | |
| PART NUMBER | HS038E |
| DESCRIPTION | STRAIGHT FITTING |
| APPLICATION | PF3/8 (O-RING) X UNF7/8, STEEL |
| REMARK | Minimum Order Quantity: 10EA |
| USE | NHP Helm pump with NH10 hose |

| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HS38NOS |
| DESCRIPTION | STRAIGHT FITTING |
| APPLICATION | PT3/8 x PF3/8, STS304 |
| REMARK | Minimum Order Quantity : 10EA |
| USE | IOC Cylinder with NH06 hose |


| | |
|---|------------------------------|
|  | |
| PART NUMBER | HS38EO |
| DESCRIPTION | STRAIGHT FITTING |
| APPLICATION | PT3/8 x UNF7/8, STEEL |
| REMARK | Minimum Order Quantity: 10EA |
| USE | IOC Cylinder with NH10 hose |

STRAIGHT CONNECTOR

| | |
|--|------------------------------|
|  | |
| PART NUMBER | HSNN |
| DESCRIPTION | PF3/8 FOR HOSE COUPLING |
| APPLICATION | PF 3/8 X 2 |
| REMARK | Minimum Order Quantity: 10EA |
| USE | 3/8" hose couplings |

| | |
|---|------------------------------|
|  | |
| PART NUMBER | HSEE |
| DESCRIPTION | UNF 7/8 FOR HOSE COUPLING |
| APPLICATION | UNF 7/8 X 2 |
| REMARK | Minimum Order Quantity: 10EA |
| USE | 7/8" hose couplings |


ELBOW FITTING

| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HL014NOS |
| DESCRIPTION | ELBOW FITTING |
| APPLICATION | PF1/4 (O-RING) x PF3/8 |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NSH Helm pump with NH06 Hose |


| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HL12EO |
| DESCRIPTION | ELBOW FITTING |
| APPLICATION | PT1/2 x UNF7/8 (O-RING) |
| REMARK | Minimum Order Quantity : 10EA |
| USE | UDC Cylinder with NH10 Hose |


TEE FITTING

| | |
|--|-------------------------------|
|  | |
| PART NUMBER | HTN300 |
| DESCRIPTION | T FITTING |
| APPLICATION | PF 3/8 X 3 |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NH06 hose |

| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HT78EE |
| DESCRIPTION | T FITTING |
| APPLICATION | UNF 7/8 X3 |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NH10 hose |

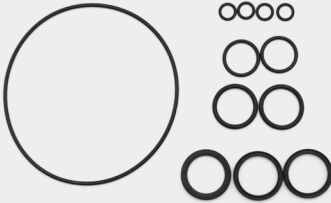
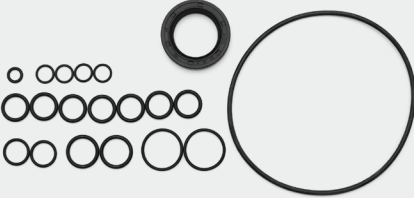



PLUG

| | |
|---|-------------------------------|
|  | |
| PART NUMBER | HP38 |
| DESCRIPTION | HOSE COUPLING PLUG |
| APPLICATION | PF 3/8 HOSE COUPLING |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NH06 Hose plug |

| | |
|---|-------------------------------|
|  | |
| PART NUMBER | NP38 |
| DESCRIPTION | FITTING PLUG |
| APPLICATION | PF 3/8 FITTING |
| REMARK | Minimum Order Quantity : 10EA |
| USE | NH06 Fitting plug |

Hydraulic Steering Components

Spare Part Kit

| Picture | PART NUMBER | DESCRIPTION |
|---|-----------------|--------------------------------------|
|  | C1800801 | SEAL KIT [FOR NSH Helm pump] |
|  | C3060803 | SEAL KIT [FOR NHP helm pump] |
|  | C4021805 | ROD KIT [FOR IOC 4020] |
| | C4021806 | ROD KIT [FOR IOC 4021] |
| | C4021807 | ROD KIT [FOR IOC 4022] |
| | C5025804 | ROD KIT [FOR IOC 5024] |
| | C5025805 | ROD KIT [FOR IOC 5025] |
| | C5025806 | ROD KIT [FOR IOC 5026] |
| | C6325804 | ROD KIT [FOR IOC 6325] |
| | C6325805 | ROD KIT [FOR IOC 6326] |
|  | C4021802 | TUBE COVER KIT L [FOR IOC 4020~4022] |
| | C5025802 | TUBE COVER KIT L [FOR IOC 5024~5026] |
| | C6325802 | TUBE COVER KIT L [FOR IOC 6325~6326] |
|  | C4021803 | TUBE COVER KIT R [FOR IOC 4020~4022] |
| | C5025803 | TUBE COVER KIT R [FOR IOC 5024~5026] |
| | C6325803 | TUBE COVER KIT R [FOR IOC 6325~6326] |

Hydraulic Steering Components

Oil & Oil Filling Kit

Oil

Hydraulic steering require a good quality of hydraulic fluid, especially in case of manual hydraulic steering.

We highly recommend to use ISO VG 15 oil.

Substitution of non-recommended fluid may result in heavy steering.

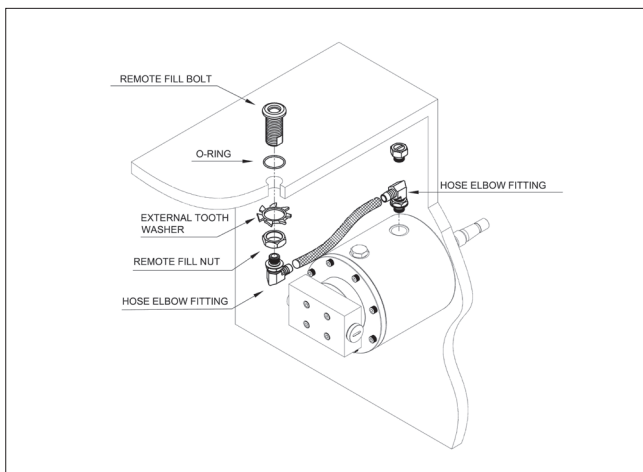


Oil Filling Kit

| Part Number | Description | Application |
|-------------|-----------------|---------------|
| OAK-300 | Oil filling kit | NSH Helm Pump |



Remote Oil Fill Kit



| Part Number | Description | Application |
|-------------|---------------------|---------------|
| RMF 38 | Remote Oil Fill Kit | NHP Helm Pump |

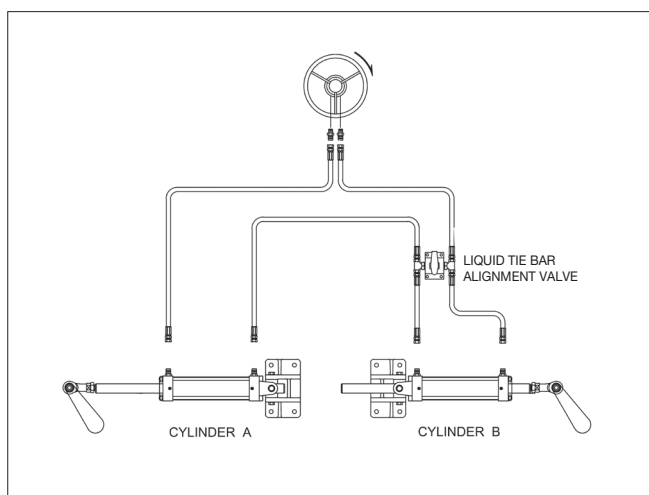
Hydraulic Steering Components

Liquid Tie Bar Alignment Valve & Oil Plug

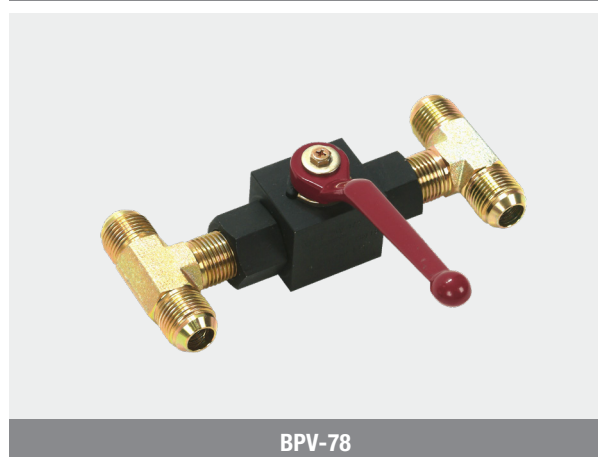
Liquid Tie Bar Alignment Valve

In case that the mechanical tie bar can not be used because of boat situation, the Liquid Tie Bar Alignment Valve can be used to allow for realignment of two rudders.

| Part Number | Thread | Application |
|-------------|-----------|-------------|
| LTB-38 | G(PF) 3/8 | 3/8" Hose |
| BPV-78 | UNF7/8 | 5/8" Hose |



LTB-38



BPV-78

Oil Plugs



C1800802



C1800803



C3060802



C3060153

| Part Number | Application | Description | Application | Application |
|-------------|----------------------|-------------|----------------------|-------------|
| C1800802 | NSH Helm Pump | Oil Plug | NSH Helm Pump | Vented |
| C1800803 | NSH Dual Station Kit | Oil Plug | NSH Dual Station Kit | Non-Vented |
| C3060802 | NHP Helm Pump | Oil Plug | NHP Helm Pump | Vented |
| C3060153 | NHP Dual Station Kit | Oil Plug | NHP Dual Station Kit | Non-Vented |

Hydraulic Steering Components

Steering Wheel & Wedge Kit

Steering Wheel



SH-300



S01-350, S01-395



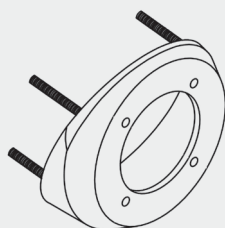
SW2-60W

| Model | Specification | Size | Material | Recommendation |
|---------|---------------|---------|-----------------|------------------|
| SH-300 | Taper 3/4" | Ø 300mm | Aluminium | NSH022, 025, 030 |
| S01-350 | | Ø 350mm | Stainless Steel | |
| S01-395 | | Ø 395mm | Stainless Steel | NSH037, 044 |
| SW2-60W | | Ø 600mm | Wooden | NHP070T |
| SW2-70W | | Ø 700mm | Wooden | NHP070T |
| SW2-80W | | Ø 800mm | Wooden | NHP070T |

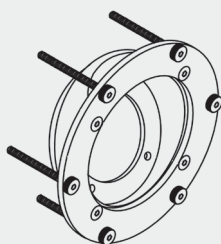
Wedge Kit

Wedge could help helm pump to be installed at angle of 20 degree to the mounting surface.

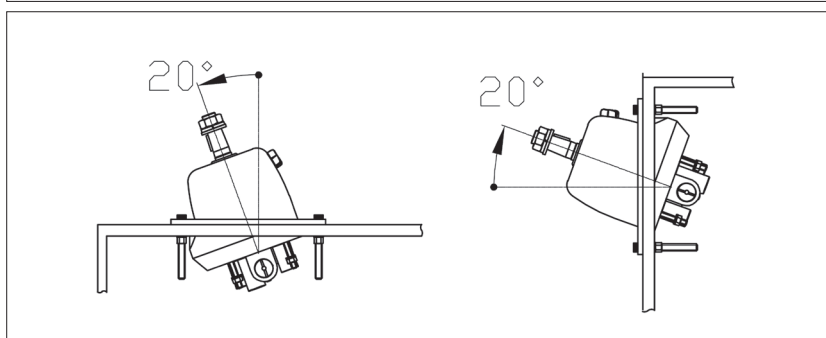
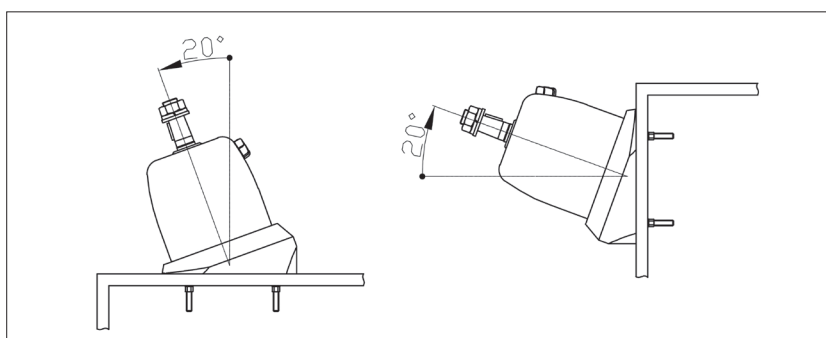
* The wedge kit can only be used for NSH helm pump



SHB 100 (Protruding type)



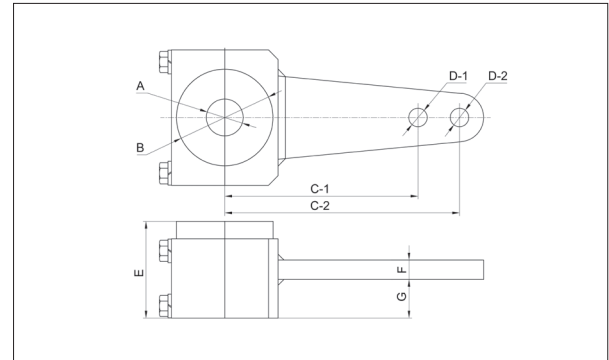
SHB 200 (Embedded type)



Hydraulic Steering Components

Tiller Arm for IOC Cylinder

Tiller arm for IOC Cylinder

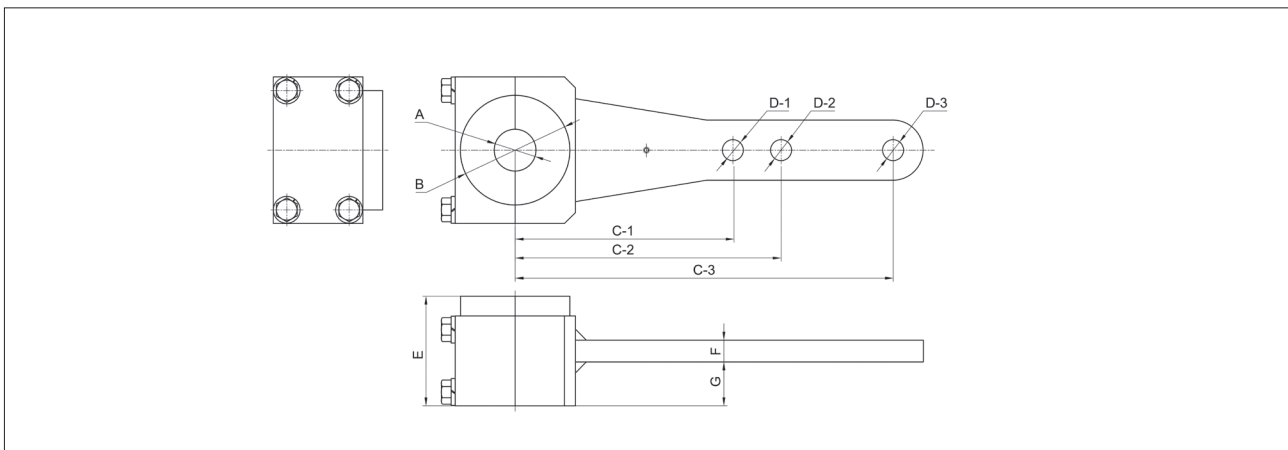


- Reamer Bolt, Washers and Nut are supplied
- Tiller arm is made of steel with hard powder coating
- Dimension : mm
- For 70 degree angle use

| Part Number | A | B | C-1 | C-2 | D-1 | D-2 | E | F | G | Application |
|-------------|---------|-----|-----|-----|------|------|-----|----|------|--------------------|
| ST57-19S | 25.4~60 | 80 | 111 | / | 19.1 | / | 70 | 15 | 35 | IOC-4020 |
| | | | / | 155 | / | 19.1 | | | | IOC-4021, IOC-5024 |
| ST09-19S | 25.4~60 | 80 | / | 199 | / | 19.1 | 70 | 15 | 27.5 | IOC-4022 |
| ST911-19S | 38.1~80 | 100 | 199 | / | 19.1 | / | 100 | 20 | 40 | IOC-5025, IOC-6325 |
| | | | / | 243 | / | 19.1 | | | | IOC-5026, IOC6326 |

Tiller arm for IOC Cylinder - Twin rudders with mechanical tie bar

- 2 sets of Reamer Bolt, Washers and Nut are supplied
- Tiller arm is made of steel with hard powder coating
- Dimension : mm
- For 70 degree angle use

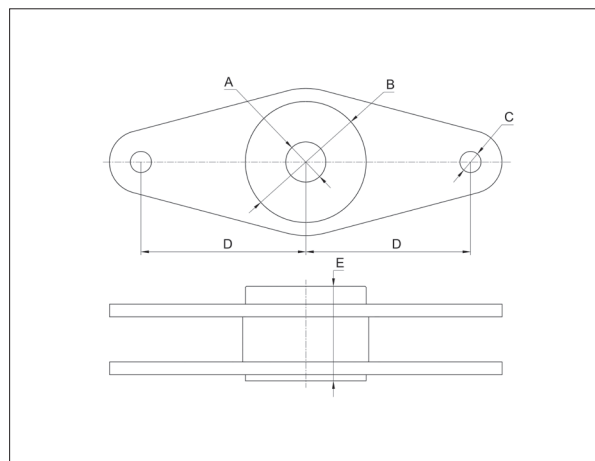


| Part Number | A | B | C-1 | C-2 | C-3 | D-1 | D-2 | D-3 | E | F | G | Application |
|-------------|---------|-----|-----|-----|-------|------|------|------|-----|----|----|-------------------|
| ST911-19T | 38.1~80 | 100 | 199 | 243 | 345.5 | 19.1 | 19.1 | 19.1 | 100 | 20 | 40 | IOC-5025~IOC-6326 |

Hydraulic Steering Components

Tiller Arm for UDC Cylinder & Ball Joint

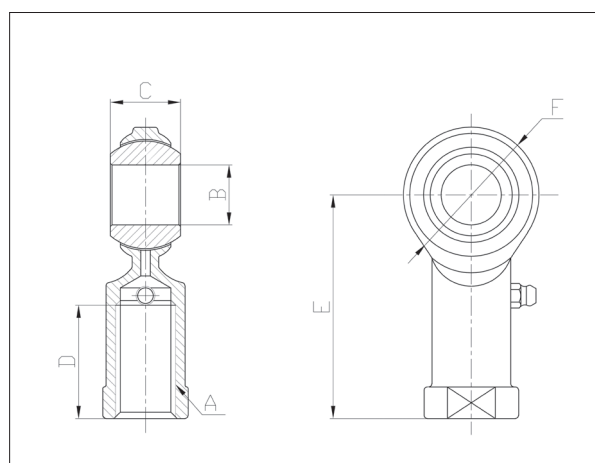
Tiller arm for UDC Cylinder - Single or Twin rudders



- 2 sets of Reamer Bolt, Washers and Nut are supplied
- Tiller arm is made of steel with hard powder coating
- Dimension : mm
- For 70 degree angle use

| Part Number | A | B | C | D | E | Application |
|-------------|----------|-----|----|-----|-----|-------------|
| ST08-25D | 38.1~80 | 115 | 25 | 157 | 90 | UDC5030 |
| ST09-25D | 38.1~80 | 115 | 25 | 178 | 90 | UDC6335 |
| ST10-30D | 38.1~100 | 140 | 30 | 197 | 101 | UDC7040 |

BALL JOINT



| Part Number | A | B | C | D | E | F | Material | Application |
|-------------|-----------|-------|----|----|-------|----|----------|--------------------|
| IF-34R | UNF3/4-16 | 19.05 | 25 | 40 | 78.2 | 50 | SUS 304 | All IOC cylinder |
| IF-25R | M25XP1.5 | 25 | 31 | 50 | 94 | 60 | Steel | UDC5030 UDC6335 |
| IF-30R | M30XP1.5 | 30 | 32 | 50 | 108.5 | 73 | Steel | UDC7040 |

Hydraulic Steering Components

Rudder Angle Indicator



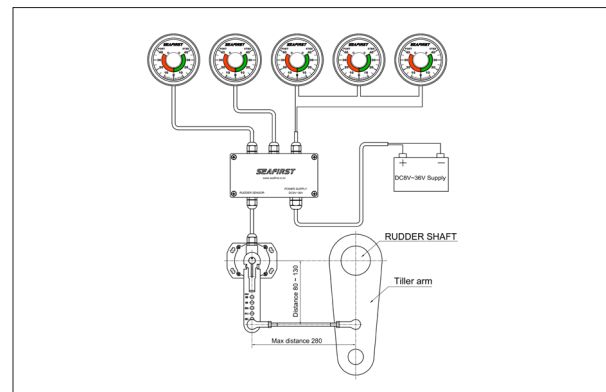
RAI-S Single Station

- Accurate, Durable needle movement
- Anti-corrosive black bezel
- Dimmer Switch
- LED on/off terminal
- Single and Dual station only
- Water resistant
- Fog resistant
- Led lighting

| Part Number | Description | Source | Remark |
|-------------|-----------------------------|---------------|-------------------------|
| DSR110 | Sensor | DC 8V ~ DC36V | Include 10meter Harness |
| DNR104 | Indicator 40-0-40 | | Dia85mm |
| SFR101 | Indicator 45-0-45 | | Dia85mm |
| SFR102 | Indicator 45-0-45 (Reverse) | | Dia85mm |

RAI-M Multi Station

- Accurate, Durable needle movement
- Anti-corrosive black bezel
- Dimmer Switch
- LED on/off terminal
- Multi-Stations max 15 indicators
- Water resistant
- Fog resistant
- Led lighting



| Part Number | Description | Source | Remark |
|-------------|-----------------------------|---------------|-------------------------|
| DSR110 | Sensor | DC 8V ~ DC36V | Include 10meter Harness |
| DSR104 | Indicator 40-0-40 | | Dia85mm |
| DSR106 | Distribution Box | | |
| SFR111 | Indicator 45-0-45 | | Dia85mm |
| SFR112 | Indicator 45-0-45 (Reverse) | | Dia85mm |

MEMO

MEMO

HYDRAULIC STEERING FOR INBOARD



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Catalog No : CAT 2106-H [2021.06]