

# Ameriloc® Hydraulic Shaft Locking Devices



# Ameriloc® hydraulic shaft locking devices provide secure shaft/hub connections

Through an exclusive agreement with TAS Schafer GmbH, Ameridrives Couplings now offers hydraulic shaft locking devices which are custom-manufactured to precise tolerances per customer specifications. Ameriloc locking devices are highly engineered to provide years of trouble-free service with features including:

- Zero backlash
- Reduced shaft stress
- High contact pressure for greater torque
- Easily installed and removed
- Elimination of keyways or splines
- Unlimited shaft positioning

The great advantage of the hydraulic SHS device lies in the significant time savings during installation. This system can be tensioned at a pressure of between 1740 and 2900 PSI (120 and 200 bar). With larger diameters, such as 20.8 in. (530 mm), the SHS can be tensioned within only a few minutes, compared to several hours required for a mechanical locking device. This time reduction increases exponentially with the diameter of the connection.

The hydraulic pump required for assembly can be a stationary unit, e.g. at test stations and assembly areas, but the use of a hydraulic hand pump is also possible. In this way, the system can also be tensioned at difficult-to-reach places such as the turret of a wind turbine. Dismantling of the SHS is also supported by the hydraulic system.

If the seals no longer work after many years of operation, the SHS can be removed like a mechanical locking device by loosening the screw connection to release pressurization.

- All units are pre-assembled, ready to install
- Torque range from 25 to 4303 ft.lbs. (34 to 5,835 kNm)
- Outer diameters from 12.5 to 53 in. (320 to 1,350 mm)
- Shaft diameters from 6.5 to 29.5 in. (165 to 750 mm)
- Additional sizes are available upon request



## State-of-the-art Facilities

Our plant is equipped with the latest manufacturing technology and features an on-site engineering department. Our manufacturing capacity allows us to meet even the most stringent customer production delivery schedules.



## Applications

Ameridrives hydraulic shaft locking devices are offered in a wide range of sizes for use on all types of industrial applications including:

- Test Stands
- Printing Presses
- Ski Lifts
- Mining Crushers
- Meat Processing
- Drilling
- Milling
- Moving Sidewalks
- Industrial Sewing
- Wind Turbines
- Winches
- Compressors
- Pulp & Paper
- Steel
- Cranes
- Fans
- Weaving

# Hydraulic Locking Device Engineering Data

## Surface Finish:

Recommended surface finish for shafts and hubs to be used is at maximum 63 RMS or 16 µm.

## Imperial Tolerances

Basic Shaft Size	4.725 to 7.086	7.087 to 9.842	9.843 to 12.401	12.402 to 15.748	15.749 to 19.685	19.686 to 24.803
Shaft OD	-.0005 -.0015	-.0006 -.0017	-.0006 -.0019	-.0007 -.0021	-.0007 -.0023	-.0008 -.0025
Hub ID	+.0015 -.0000	+.0018 -.0000	+.0020 -.0000	+.0022 -.0000	+.0024 -.0000	+.0027 -.0000

## Metric Tolerances

Shaft OD: <150mm h6  
>155mm g6

Hub ID: H7

Hub OD: f7

## Values of Various Materials

.2% Yield Stress (N/mm <sup>2</sup> )	150	180	200	220	250	270	300	350	400
.2% Yield Stress PSI	21,756	26,107	29,008	31,909	36,260	39,160	43,512	50,764	58,016
Material	GG-22	GG-26 GS-38 V2A-S A-216 4340	GG-30 V2A-E V4A-S GTS-35 CLASS45 32510	GS-45 ST35 ST37-3 V4A-E	GS-52 GGG-38 ST42-3 C22 1022	GGG-42 ST50-2 C35 AlCuNiC 1035	GS-60 ST60-2 ST55 GTS-45 40010	GS-62 GGG-50 ST70-2 C45 1045 80-55-06	GS-70 GGG-60 C60 1060

## Torque:

For proper selection of hydraulic locking devices, nominal torque and peak torque must be established. Nominal drive torque can be calculated as follows:

$$*T_n \text{ (Torque Nominal)} \quad \text{ft.lbs.} = \frac{5252 \times \text{HP}}{\text{rpm}} \quad (\text{Nm}) = \frac{7097 \times \text{HP}}{\text{rpm}}$$

$$*T_p \text{ (Torque Peak)} \quad = T_n \times \text{Safety Factor}$$

Always select a unit where  $M_t$  is greater than  $T_p$ .

With the simultaneous transmission torque and axial force, the torque is reduced according to the following formula:

$$M_{\text{red}} = \sqrt{M_t^2 - \left(F_{\text{ax}} \cdot \frac{d_w}{2}\right)^2}$$

$M_t$  = maximum transmissible torque

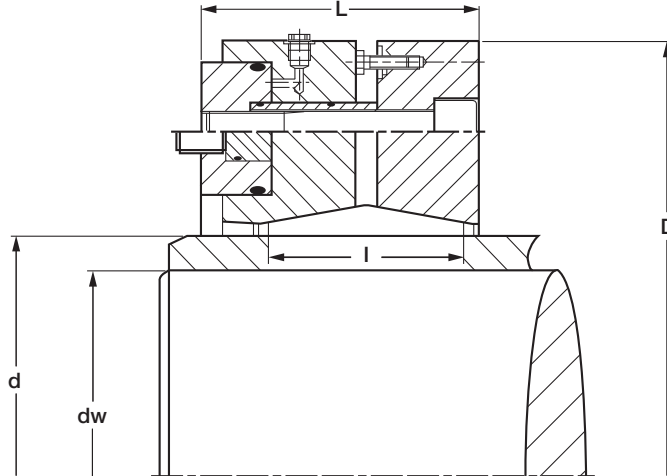
$M_{\text{red}}$  = reduced maximum torque with simultaneous axial force

$F_{\text{ax}}$  = maximum transmissible axial force

$d_w$  = shaft diameter

# Dimensions

## Type SHS



Mt= Transmissible torque per locking device  
p= pressure on nominal dia. d

## Dimensions

Model No.	dw* in. (mm)	Transmissible Torque in/Lbs x 1000 (kNm)	d in. (mm)	D in. (mm)	L in. (mm)	I in. (mm)	Pressure PSI (N/mm <sup>2</sup> )	Weight LBS (kg)	Hydraulic Pressure PSI (Bar)
SHS-165	4.50 (115)	301 (34)	6.4944/6.4928 (165)	12.60 (320)	3.82 (97)	2.21 (56)	34,083 (235)	84 (38)	2,611 (180)
	4.75 (120)	336 (38)							
	4.88 (125)	372 (42)							
SHS-175	4.88 (125)	389 (44)	6.8881/6.8865 (175)	13.39 (340)	3.82 (97)	2.21 (56)	35,969 (248)	95 (43)	2,611 (180)
	5.12 (130)	425 (48)							
	5.25 (135)	469 (53)							
SHS-185	5.25 (135)	584 (66)	7.2814/7.2797 (185)	13.98 (355)	4.21 (107)	2.80 (71)	35,969 (248)	115 (52)	2,611 (180)
	5.50 (140)	620 (70)							
	5.75 (145)	682 (77)							
SHS-195	5.50 (140)	646 (73)	7.6751/7.6734 (195)	15.35 (390)	4.61 (117)	2.80 (71)	36,984 (255)	157 (71)	2,611 (180)
	5.75 (150)	752 (85)							
	6.00 (155)	805 (91)							
SHS-200	5.75 (150)	770 (87)	7.8720/7.8703 (200)	15.35 (390)	4.61 (117)	2.80 (71)	38,000 (262)	155 (70)	2,466 (170)
	6.00 (155)	814 (92)							
	6.25 (160)	885 (100)							
SHS-220	6.25 (160)	991 (112)	8.6594/8.6577 (220)	16.93 (430)	5.39 (137)	3.46 (88)	35,389 (244)	225 (102)	2,611 (180)
	6.50 (165)	1,062 (120)							
	6.75 (170)	1,141 (129)							
SHS-240	6.75 (170)	1,062 (120)	9.4468/9.4451 (240)	17.72 (450)	5.79 (147)	3.62 (92)	31,908 (220)	238 (108)	2,611 (180)
	7.00 (180)	1,221 (138)							
	7.50 (190)	1,372 (155)							
SHS-260	7.50 (190)	1,496 (169)	10.2340/10.2320 (260)	18.90 (480)	6.22 (158)	4.06 (103)	31,763 (219)	282 (128)	2,611 (180)
	7.75 (200)	1,637 (185)							
	8.25 (210)	1,903 (215)							
SHS-280	8.25 (210)	1,814 (205)	11.0214/11.0194 (280)	20.27 (515)	6.89 (175)	4.49 (114)	28,282 (195)	348 (158)	2,611 (180)
	8.50 (220)	2,035 (230)							
	9.00 (230)	2,257 (255)							
SHS-300	9.00 (230)	2,495 (282)	11.8088/11.8068 (300)	21.26 (540)	7.44 (189)	4.80 (122)	29,297 (202)	465 (211)	2,611 (180)
	9.50 (240)	2,743 (310)							
	9.75 (245)	2,876 (325)							
SHS-320	9.50 (240)	2,655 (300)	12.5960/12.5938 (320)	21.85 (555)	7.44 (189)	4.80 (122)	29,152 (201)	476 (216)	2,611 (180)
	10.00 (250)	2,903 (328)							
	10.25 (260)	3,186 (360)							
SHS-340	10.00 (250)	3,168 (358)	13.3834/13.3812 (340)	24.02 (610)	8.19 (208)	5.28 (134)	29,007 (200)	639 (290)	2,755 (190)
	10.25 (260)	3,434 (388)							
	10.50 (270)	3,761 (425)							

dw\*- Imperial units are not a direct conversion of the metric shafts, these are examples of standard shaft sizes. The metric dimensions are the true range.

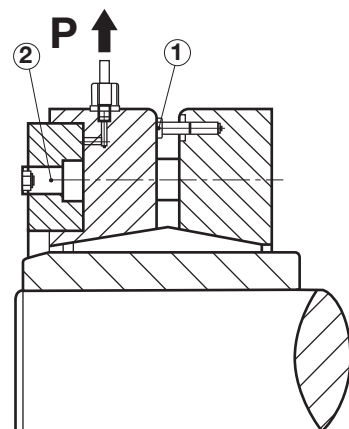
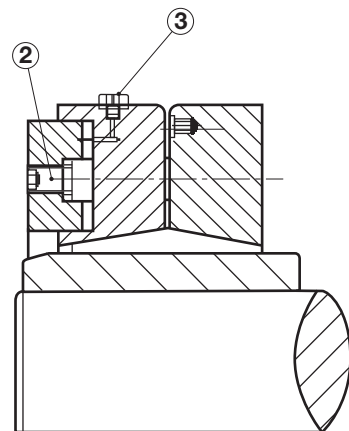
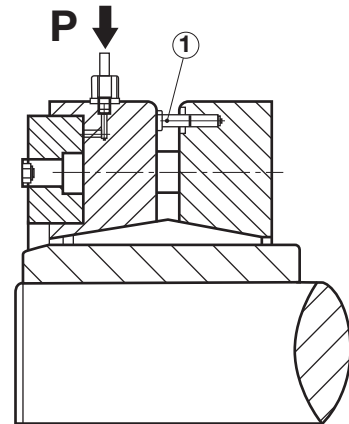
## Type SHS

Model No.	dw* in. (mm)	Transmissible Torque in/Lbs x 1000 (kNm)	d in. (mm)	D in. (mm)	L in. (mm)	l in. (mm)	Pressure PSI (N/mm <sup>2</sup> )	Weight LBS (kg)	Hydraulic Pressure PSI (Bar)
SHS-350	10.75 (270)	3,762 (425)	13.7771/13.7749 (350)	24.21 (615)	8.62 (219)	5.51 (140)	28,137 (194)	670 (304)	2,900 (200)
	11.00 (280)	4,089 (462)							
	11.25 (285)	4,266 (482)							
SHS-360	11.00 (280)	4,195 (474)	14.1708/14.1686 (360)	24.80 (630)	8.62 (219)	5.51 (140)	28,717 (198)	701 (318)	2,900 (200)
	11.50 (290)	4,549 (514)							
	11.75 (295)	4,735 (535)							
SHS-390	12.00 (300)	5,044 (570)	15.3519/15.3497 (390)	27.76 (705)	8.70 (221)	4.49 (114)	29,442 (203)	904 (410)	2,755 (190)
	12.25 (310)	5,443 (615)							
	12.50 (320)	5,841 (660)							
SHS-420	13.00 (330)	6,682 (755)	16.5328/16.5303 (420)	29.53 (750)	9.25 (235)	6.46 (164)	28,137 (194)	1,058 (480)	2,900 (200)
	13.50 (340)	7,169 (810)							
	13.75 (350)	7,655 (865)							
SHS-440	13.50 (340)	7,523 (850)	17.3202/17.3177 (440)	30.91 (785)	10.43 (265)	6.97 (177)	27,702 (191)	1,338 (607)	2,611 (180)
	13.75 (350)	8,054 (910)							
	14.00 (360)	8,585 (970)							
SHS-460	14.00 (360)	8,585 (970)	18.1076/18.1051 (460)	31.89 (810)	10.43 (265)	6.97 (177)	27,992 (193)	1,422 (645)	2,611 (180)
	14.50 (370)	9,116 (1030)							
	15.00 (380)	9,735 (1100)							
SHS-480	15.00 (380)	10,798 (1220)	18.8950/18.8925 (480)	33.66 (855)	11.22 (285)	7.40 (188)	29,877 (206)	1,721 (781)	2,611 (180)
	15.50 (390)	11,506 (1300)							
	15.75 (400)	12,214 (1380)							
SHS-500	15.75 (400)	12,302 (1390)	19.6824/19.6799 (500)	34.65 (880)	11.22 (285)	7.40 (188)	30,022 (207)	1,909 (866)	2,611 (180)
	16.00 (410)	12,833 (1450)							
	16.50 (420)	13,630 (1540)							
SHS-530	17.00 (430)	16,595 (1875)	20.8631/20.8604 (530)	37.00 (940)	11.81 (300)	8.46 (215)	30,603 (211)	2,097 (951)	2,611 (180)
	17.25 (440)	17,347 (1960)							
	17.75 (450)	18,365 (2075)							
SHS-560	17.75 (450)	17,524 (1980)	20.0443/20.0415 (560)	37.99 (965)	11.81 (300)	8.46 (215)	29,587 (204)	2,138 (970)	2,900 (200)
	18.00 (460)	18,409 (2080)							
	18.50 (470)	19,339 (2185)							
SHS-590	18.50 (470)	18,763 (2120)	23.2254/23.2226 (590)	38.98 (990)	12.80 (325)	9.25 (235)	26,541 (183)	2,299 (1043)	2,900 (200)
	19.00 (480)	19,649 (2220)							
	19.25 (490)	20,533 (2320)							
SHS-620	19.75 (500)	20,976 (2370)	24.4065/24.4037 (620)	40.16 (1020)	12.80 (325)	9.25 (235)	26,251 (181)	2,509 (1138)	2,900 (200)
	20.00 (510)	21,772 (2460)							
	20.50 (520)	22,835 (2580)							
SHS-640	20.50 (520)	23,808 (2690)	25.1937/25.1906 (640)	40.94 (1040)	12.80 (325)	9.25 (235)	27,557 (190)	2,590 (1175)	2,611 (180)
	20.75 (530)	24,782 (2800)							
	21.25 (540)	25,932 (2930)							
SHS-660	20.75 (530)	25,313 (2860)	25.9811/25.9780 (660)	44.49 (1130)	14.96 (380)	10.24 (260)	28,282 (195)	3,836 (1740)	2,611 (180)
	21.25 (540)	26,375 (2980)							
	21.50 (550)	27,437 (3100)							
SHS-700	22.00 (560)	24,516 (2770)	27.5559/27.5528 (700)	49.21 (1250)	14.06 (357)	10.83 (275)	26,977 (186)	5,952 (2700)	2,611 (180)
	22.75 (580)	26,579 (3003)							
	23.50 (600)	28,676 (3240)							
SHS-720	22.75 (580)	28,410 (3210)	28.3433/28.3402 (720)	48.82 (1240)	13.39 (340)	9.84 (250)	25,526 (176)	5,313 (2410)	2,611 (180)
	23.50 (600)	30,623 (3460)							
	24.25 (620)	32,924 (3720)							
SHS-750	23.50 (600)	44,873 (5070)	29.5244/29.5213 (750)	53.15 (1350)	16.93 (430)	11.02 (280)	28,427 (196)	6,438 (2920)	2,611 (180)
	24.25 (620)	48,148 (5440)							
	25.00 (640)	51,644 (5835)							

dw\*- Imperial units are not a direct conversion of the metric shafts, these are examples of standard shaft sizes. The metric dimensions are the true range.



# Installation



The shrink discs are supplied assembled and ready to install.

## Assembly

1. The hub bore and the solid shaft must be clean and grease free.
2. Locate the shrink disc in the appropriate position.  
**Attention:** Do not activate hydraulic pressure before the shaft is in place in the hub bore.
3. Tighten jacking screw Item 1 back into position.
4. Connect the hydraulic pump (hand or electric) via a hose coupling to the hydraulic port (R 1/4").
5. Activate the shrink disc by applying hydraulic pressure approx. 2,610 psi (180 bar).
6. Tighten all bolts Item 2 so that they are firmly seated.  
**Important:** Make sure to fasten all bolts before releasing the hydraulic pressure.
7. Release the hydraulic pressure. Open the second hydraulic port Item 3 to aid drainage. The hydraulic fluid will flow back to the pump reservoir.
8. Assemble hydraulic port plugs Item 3.

## Disassembly

1. Remove hydraulic port plug Item 3 and connect the pump hose.
2. Apply 2,500-2,900 psi (170-200 bar) pressure. Loosen all bolts Item 2.
3. Release the hydraulic pressure and unscrew the jacking screws Item 1 until the locking device releases.
4. Tighten the jacking screws Item 1 back into original position.
5. Remove the hydraulic hose coupling and assemble the (2) port plugs Item 3. Remove the locking device.

# Application Data Sheet

**Contact Information:**

Date \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_

**Mail or Fax to:**

Ameridrives Couplings  
 Application Engineering  
 1802 Pittsburgh Ave.  
 Erie, PA 16502

**FAX: 814-453-5891**  
 Phone: 814-480-5000

**Specifications and Dimensions:**

Max torque	_____ ft.lbs _____ kNm	Shaft diameter	_____ inches _____ mm	Additional Information: _____ _____ _____ _____ _____ _____ _____
Max. bending moment	_____ ft.lbs. _____ kNm	In case of hollow shaft, internal diameter	_____ inches _____ mm	
Max. axial load	_____ lbs. _____ kg	Speed	_____ rpm	
Max. radial load	_____ lbs. _____ kg	Hub outside diameter	_____ inches _____ mm	
Dimensions		Hub width	_____ inches _____ mm	
Height	_____ inches _____ mm	Hub material yield strength	_____ psi _____ N/mm <sup>2</sup>	
Width	_____ inches _____ mm	Shaft material yield strength	_____ psi _____ N/mm <sup>2</sup>	
Depth	_____ inches _____ mm	Ambient temperature	_____ ° F _____ ° C	

**Sketch of Application:**

**Ameridrives offers a wide variety of shaft locking devices and couplings**

**Ameriloc® Internal Locking Devices**

See Catalog P-1971-AC

**Ameriloc® External Locking Devices**

See Catalog P-1972-AC

**Ameriloc® Shaft Couplings**

See Catalog P-1973-AC

All Customer Service phone numbers shown in bold

## Electromagnetic Clutches and Brakes

### Warner Electric

*Electromagnetic Clutches and Brakes*

New Hartford, CT - USA  
**1-800-825-6544**

*For application assistance:*  
 1-800-825-9050

St Barthelemy d'Anjou, France  
**+33 (0) 2 41 21 24 24**

*Precision Electric Coils and Electromagnetic Clutches and Brakes*

Columbia City, IN - USA  
**1-260-244-6183**

### Matrix International

*Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes*

Brechin, Scotland  
**+44 (0) 1356 602000**

New Hartford, CT - USA  
**1-800-825-6544**

### Inertia Dynamics

*Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes*

New Hartford, CT - USA  
**1-800-800-6445**

## Overrunning Clutches

### Formsprag Clutch

*Overrunning Clutches and Holdbacks*

Warren, MI - USA  
**1-800-348-0881** – Press #1

*For application assistance:*  
 1-800-348-0881 – Press #2

### Marland Clutch

*Roller Ramp and Sprag Type Overrunning Clutches and Backstops*

Burr Ridge, IL - USA  
**1-800-216-3515**

### Stieber Clutch

*Overrunning Clutches and Holdbacks*

Heidelberg, Germany  
**+49 (0) 6221 30 47 0**

## Engineered Couplings

### Ameridrives Couplings

*Mill Spindles, Ameriflex, Ameridisc*

Erie, PA - USA  
**1-814-480-5000**

*Gear Couplings*

San Marcos, TX - USA  
**1-800-458-0887**

### Bibby Transmissions

*Disc, Gear, Grid Couplings, Overload Clutches*

Dewsbury, England  
**+44 (0) 1924 460801**

Boksburg, South Africa  
**+27 11 918 4270**

### TB Wood's

*Elastomeric Couplings*

Chambersburg, PA - USA  
**1-888-829-6637** – Press #5

*For application assistance:*  
 1-888-829-6637 – Press #7

*General Purpose Disc Couplings*

San Marcos, TX - USA  
**1-888-449-9439**

### Ameridrives Power Transmission

*Universal Joints, Drive Shafts, Mill Gear Couplings*

Green Bay, WI - USA  
**1-920-593-2444**

### Huco Dynatork

*Precision Couplings and Air Motors*

Hertford, England  
**+44 (0) 1992 501900**

Charlotte, NC - USA  
**1-800-825-6544**

## Linear Products

### Warner Linear

*Linear Actuators and Guideways*

Belvidere, IL - USA  
**1-800-825-6544**

*For application assistance:*  
 1-800-825-9050

St Barthelemy d'Anjou, France  
**+33 (0) 2 41 21 24 24**

## Heavy Duty Clutches and Brakes

### Wichita Clutch

*Pneumatic Clutches and Brakes*

Wichita Falls, TX - USA  
**1-800-964-3262**

Bedford, England  
**+44 (0) 1234 350311**

### Twiflex Limited

*Caliper Brakes and Thrusters*

Twickenham, England  
**+44 (0) 20 8894 1161**

### Industrial Clutch

*Pneumatic and Oil Immersed Clutches and Brakes*

Waukesha, WI - USA  
**1-262-547-3357**

## Gearing

### Boston Gear

*Enclosed and Open Gearing, Electrical and Mechanical P.T. Components*

Charlotte, NC - USA  
**1-800-825-6544**

*For application assistance:*  
 1-800-816-5608

### Nuttall Gear and Delroyd Worm Gear

*Worm Gear and Helical Speed Reducers*

Niagara Falls, NY - USA  
**1-716-298-4100**

## Belted Drives and Sheaves

### TB Wood's

*Belted Drives*

Chambersburg, PA - USA  
**1-888-829-6637** – Press #5

*For application assistance:*  
 1-888-829-6637 – Press #7

## Engineered Bearing Assemblies

### Kilian Manufacturing

*Engineered Bearing Assemblies*

Syracuse, NY - USA  
**1-315-432-0700**

## Asia Pacific Sales Offices

### Australia

Unit 51/9, Hoyle Avenue  
 Castle Hill, NSW 2154  
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**+61 2 9894 0368** (Fax)  
[www.warnerelectric.com.au](http://www.warnerelectric.com.au)

### China - Hong Kong

Room 304A, 3rd Floor  
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 71-75 Container Port Rd.  
 Kwai Chung, Hong Kong  
**+852 2615 9313**  
**+852 2615 9162** (Fax)  
[www.warnerelectric.com.hk](http://www.warnerelectric.com.hk)

### China - Shanghai

Shanghai Universal Mansion  
 Suite 703, 168 Yuyuan Road,  
 Shanghai 200040  
**+86 21 5169-9255**  
**+86 21 6248 5387** (Fax)  
[www.altramotion.com.cn](http://www.altramotion.com.cn)

### China - Taiwan

3rd Fl., No. 35, Lane 32  
 Kwang-Fu, South Road  
 10562 Taipei  
**+886 2 2577 8156**  
**+886 2 2570 6358** (Fax)  
[www.warnerelectric.com.tw](http://www.warnerelectric.com.tw)

### Singapore

39 Benoi Road  
 Singapore 627725  
**+65 6487 4464**  
**+65 6487 6674** (Fax)  
[www.warnerelectric.com.sg](http://www.warnerelectric.com.sg)

### Thailand

178 Soi Anamai Srinakarini Rd.,  
 Suanluang Bangkok 10250  
**+66 2 322 5527**  
**+66 2 320 2380** (Fax)  
[www.warnerelectric.co.th](http://www.warnerelectric.co.th)

For more information, or to contact authorized agents in Japan, Korea, India, or elsewhere in Asia Pacific, send an email to: [ap@altramotion.com](mailto:ap@altramotion.com)



[www.ameridrives.com](http://www.ameridrives.com)

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