



- 150-350w rotary actuator develops 20 ft-lb (27 Nm) of torque.
- Continuous 360° rotation, reversible, and continuously variable speed.
- Powerful, high speed DC brushless gear motor for reliability, efficiency and lightweight.
- 16 output speeds ranging from 1.5rpm to 75rpm with 8 input voltages of 24vdc to 300vdc.
- Holding or backdrive torque is 25%-50% of rated torque and actuator can be fitted with an optional electro-magnetic brake.
- Available with +/-5v analog speed control or RS232/RS485 position control.
- Rated to full ocean depth with an oil filled, pressure balanced motor / gear housing and remote electronics in a 1-atmosphere housing or to 50m with a 1-atmosphere housing and self-contained electronics.
- Available with hard anodized aluminum, Type 316 stainless steel or 6Al4V titanium housings.
- Available with motors for 24vdc, 48vdc, 70vdc, 85vdc, 100vdc, 150vdc, 200vdc, 250vdc and 300vdc. Other voltages optional.

Output Speed

15 output speeds from 1.5rpm to 45rpm with a torque rating of 20 ft-lb (27 Nm). 75rpm with a torque rating of 10 ft-lb (13.5Nm).

Input

150-300 W at voltages of 24 - 300vdc, +/-5v analog speed control or full digital servo speed, torque or position control.

Weight

2.5-5 lbs (1.2-2.4 kg) in air, 1.6-3.2 lbs (.7 - 1.4 kg) in water, depending on configuration.

Depth Rating

Full ocean depth when oil filled with remote electronics, 150ft (50m) with 1 atm housings.

(specifications subject to change without notice)

Introduction

The Model 20 is one of 9 very efficient, lightweight DC brushless rotary actuators produced by Tecnadynne. With continuous, variable speed rotation in both directions, the Model 20 is perfectly suited for many applications on AUV's, ROV's, manned submersibles and subsea tooling packages.

Performance Characteristics

As with all of Tecnadynne's rotary actuators, the Model 20 has multiple gearing stages. The first stage is always a 7/1 ratio planetary gearset; for extremely low output speeds multiple planetary stages are used. The final, output stage is always a harmonic drive and these are available in ratios from 30/1 to 120/1. Using different combinations of ratios, Tecnadynne is able to supply Model 20's with 16 output speeds ranging from 1.5rpm to 75rpm. The maximum output torque of 20 ft-lbs (27 Nm) can be achieved at all speeds of operation, from 0rpm to the maximum rated speed (the 75rpm version is limited to 10 ft-lbs or 13.5 Nm).

DC Brushless Motor

Employing a 3-phase DC brushless motor that has been optimized for high efficiency and low noise, the Model 20 delivers exceptional reliability and high power in an extremely compact, lightweight and easy to maintain package. As with all Tecnadynne thrusters and actuators, the Model 20 motors are manufactured in the U.S. to the ISO 9001:2008 quality standard.

Depth Rating Options

The standard Model 20 configuration utilizes an oil filled housing for the DC brushless motor and gearing units, thus requiring that the electronics module be installed in a remote, 1-atmosphere housing (customer supplied). This configuration is rated to full ocean depth and the oil is compensated using flexible Tygon tubing for the cabling. Alternately, for shallow water applications, the Model 20 can be supplied with 1-atmosphere housings and internal electronics. This configuration is rated to 150 fsw (50 msw).

Voltages Supported

The Model 20 is available for operation at voltages of 24vdc, 48vdc, 70vdc, 85vdc, 100vdc, 150vdc, 200vdc, 250vdc and 300vdc. Alternate voltages are possible but will result in maximum output speeds not currently listed in this datasheet. DC power must be supplied by a well filtered battery bank, rectified and filtered AC or a regulated DC power supply with less than 10% voltage ripple.

Speed & Position Control

The oil filled configuration of the Model 20 can be supplied with several remote controllers depending upon the customer's operating requirements and the available space in the customer's 1-atmosphere housing (or Tecnadynne can supply a suitable housing). The most compact remote electronics option (HPFX & HPRX) is an open loop speed mode controller which accepts a +/-5v analog speed control signal. Alternately, Tecnadynne can supply an Advanced Motion Controls servo drive in two voltage ranges (AMCL & AMCH), that operate in current, velocity or position mode (when coupled with a suitable external position sensor). The 50m depth rated, 1-atmosphere version of the Model 20 can be supplied with an internal controller. This is an open loop speed mode controller accepting a +/-5v analog command signal.

Electro-magnetic Brake Option

The holding or backdrive torque of an unpowered actuator is 25%-50% of the rated torque, depending on gearing ratio. If higher holding torque is required, an optional electro-magnetic brake can be installed.

Other Options

Optional configurations include: housings made from hard anodized aluminum (standard), Type 316 stainless steel or 6Al4V titanium; several bulkhead type or cable end subsea connectors.

Please note that these specifications are subject to change without notice.

Go to www.tecnadyne.com



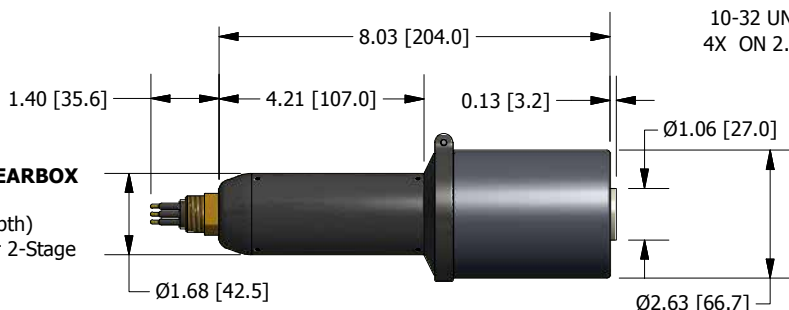
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MODEL 20

1-ATMOSPHERE, 1-STAGE GEARBOX VERSION

(Rated to 150 ft [50 m] Depth)
(Available with Internal Brake or 2-Stage Gearbox Options)



w/ 1-STAGE GEARBOX
(Output Speeds of 12 - 75 rpm)

1/4-28 UNF - 2B ∇ 0.50
4X ON 0.75 [19] PCD

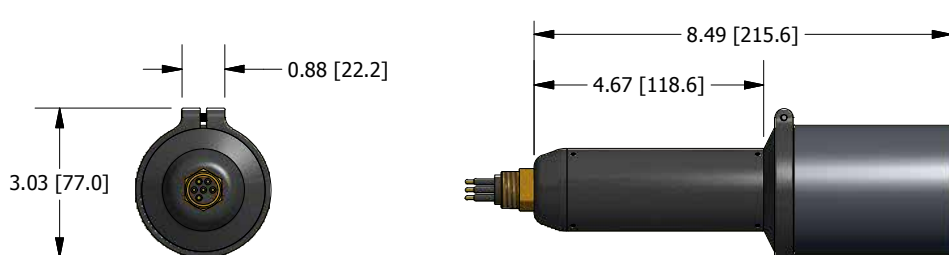


OIL FILLED, 1-STAGE GEARBOX VERSION
(Rated to Full Ocean Depth)
(Available with Internal Brake or 2-Stage Gearbox Options)

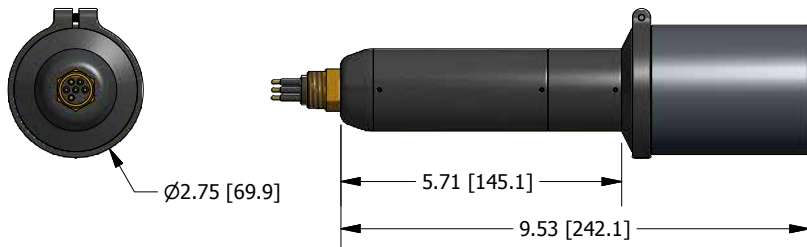
SCALE 1:4

Download STP solid model of this rotary actuator here:
http://www.tecnadyne.com/rotary_actuators

MODEL 20



W/ INTERNAL BRAKE OPTION
(Available with 1-Atmosphere & Oil Filled Options)

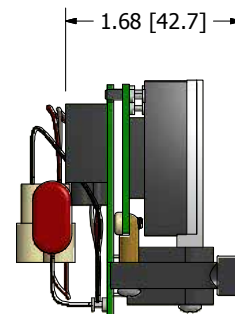
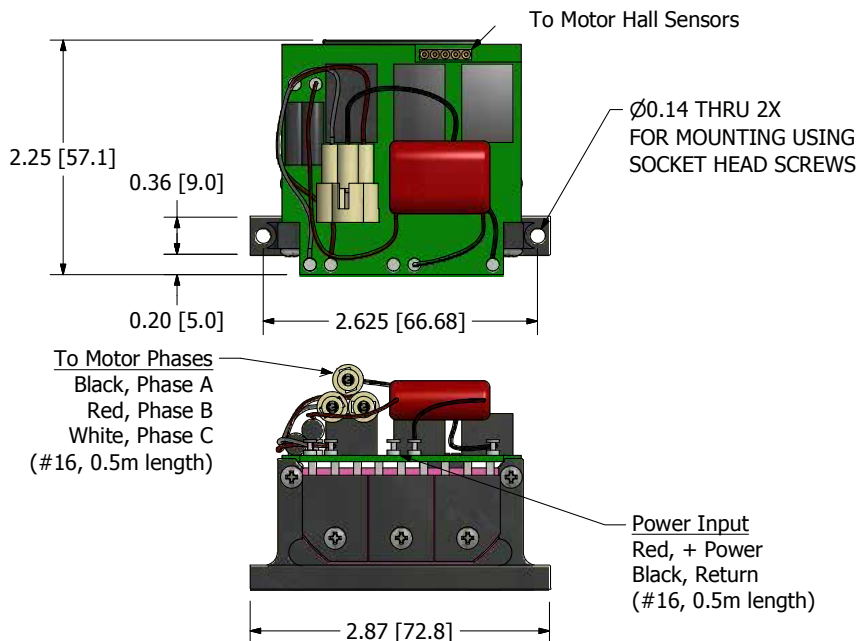


W/ 2-STAGE GEARBOX OPTION
(Output Speeds of 2 - 11 rpm)
(Available with 1-Atmosphere & Oil Filled Options)

Download STP solid model of this rotary actuator here:
http://www.tecnadyne.com/rotary_actuators

REMOTE ELECTRONICS MODULE, HPFX CONFIG

USED IN THE **HPFX** CONFIGURATION & INSTALLED IN CUSTOMER FURNISHED PRESSURE VESSEL.



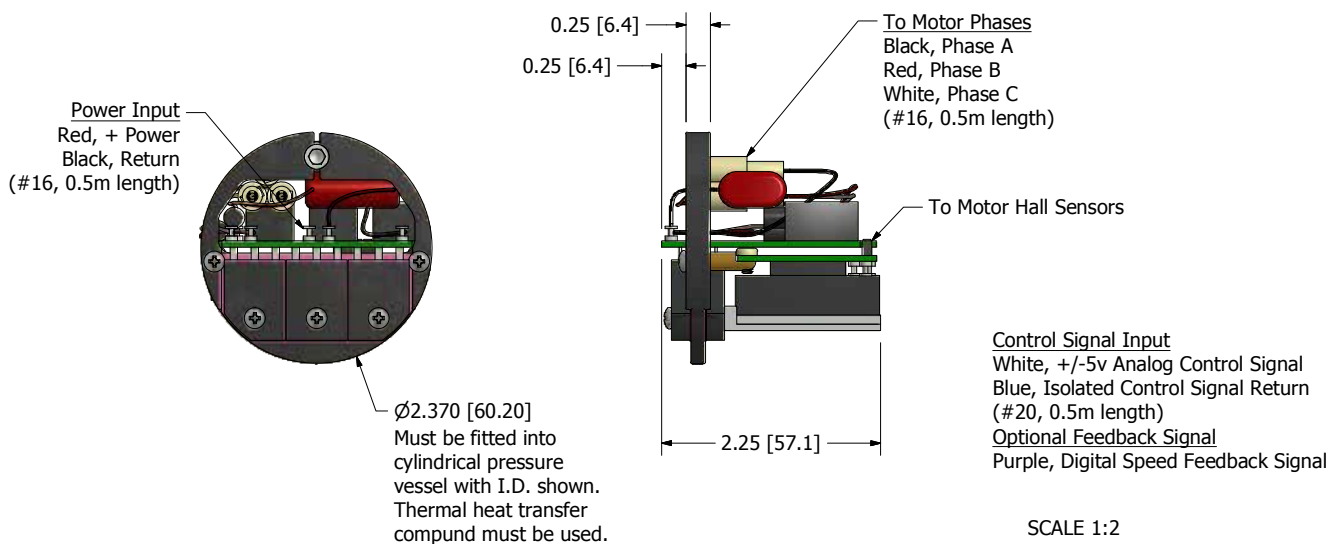
Control Signal Input
White, +/-5v Analog Control Signal
Blue, Isolated Control Signal Return (#20, 0.5m length)
Optional Feedback Signal
Purple, Digital Speed Feedback Signal

SCALE 1:2

Download STP solid model of this electronics module here:
http://www.tecnadyne.com/rotary_actuators

REMOTE ELECTRONICS MODULE, HPRX CONFIG

USED IN THE **HPRX** CONFIGURATION & INSTALLED IN CUSTOMER FURNISHED PRESSURE VESSEL.



Control Signal Input
White, +/-5v Analog Control Signal
Blue, Isolated Control Signal Return (#20, 0.5m length)
Optional Feedback Signal
Purple, Digital Speed Feedback Signal

SCALE 1:2

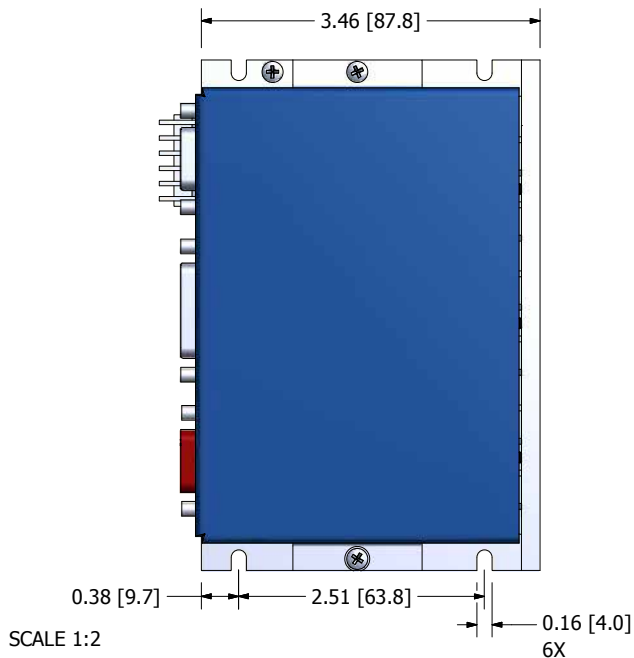
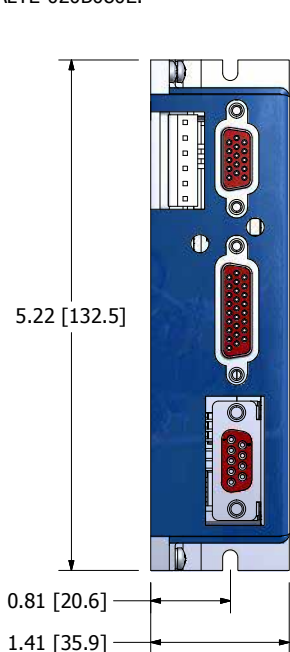
Download STP solid model of this electronics module here:
http://www.tecnadyne.com/rotary_actuators

REMOTE ELECTRONICS MODULE, AMCL CONFIG

ADVANCED MOTION CONTROLS DPRALTE-020B080E.

REFER TO THE ADVANCED MOTION CONTROLS WEBSITE FOR ADDITIONAL TECHNICAL INFORMATION ABOUT THIS CONTROLLER -- WWW.A-M-C.COM

Input Voltage Range
20vdc - 80vdc
Input Control Signals
+/-10 analog, RS232 / RS485



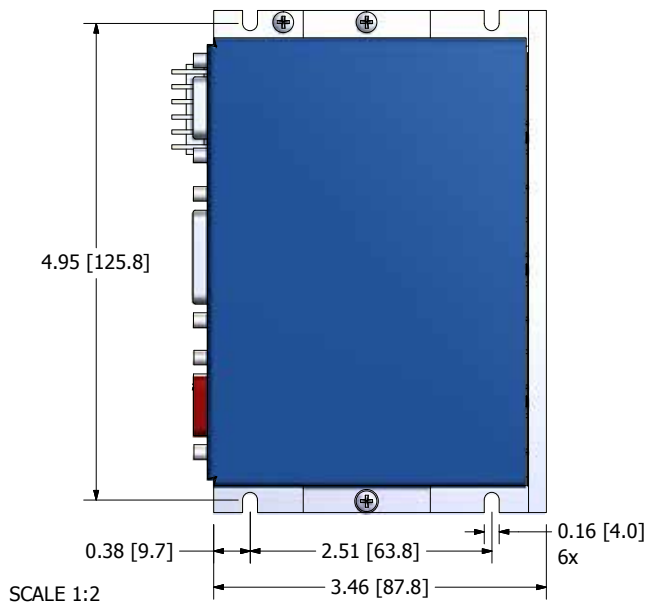
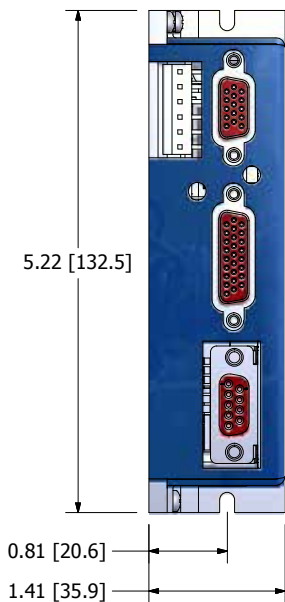
Download STP solid model of this electronics module here:
http://www.tecnadyne.com/rotary_actuators

REMOTE ELECTRONICS MODULE, AMCH CONFIG

ADVANCED MOTION CONTROLS DPRALTE-015B200E.

REFER TO THE ADVANCED MOTION CONTROLS WEBSITE FOR ADDITIONAL TECHNICAL INFORMATION ABOUT THIS CONTROLLER -- WWW.A-M-C.COM

Input Voltage Range
40vdc - 190vdc
Input Control Signals
+/-10 analog, RS232 / RS485



Download STP solid model of this electronics module here:
http://www.tecnadyne.com/rotary_actuators

20 - AAA - BB - CCCCC - XX - DD - EEEE - Y

AAA - Buss Voltage Option (Consult factory for other voltages)

24 - 24vdc	85 - 85vdc	200 - 200vdc
48 - 48vdc	100 - 100vdc	250 - 250vdc
70 - 70vdc	150 - 150vdc	300 - 300vdc

BB - Output Speed Option (Consult factory for other speeds)

1.5 - 1.5rpm, 150W, 2-stage	4 - 4rpm, 150W, 2-stage	16 - 16rpm, 200W
2 - 2rpm, 150W, 2-stage	6 - 6rpm, 150W, 2-stage	18 - 18rpm, 225W
2.2 - 2.2rpm, 150W, 2-stage	10 - 10rpm, 150W, 2-stage	22 - 22rpm, 250W
2.5 - 2.5rpm, 150W, 2-stage	12 - 12rpm, 175W	28 - 28rpm, 275W
3 - 3rpm, 150W, 2-stage	14 - 14rpm, 175W	45 - 45rpm, 300W
		75 - 75rpm, 300W, 10 ft-lb (13Nm)

CCCCC - Subsea Connector Option (Consult factory for other connectors)

- MCPBOF8M** - Subconn MCPBOF8M, oil filled tubing, for oil filled, remote electronics only
- MCPBOF10M** - Subconn MCPBOF10M, oil filled tubing, for oil filled, remote electronics w/ brake
- MHDG8CCP** - Impulse MHDG-8-CCPOF, oil filled tubing, for oil filled, remote electronics only
- MHDG10CCP** - Impulse MHDG-10-CCPOF, oil filled tubing, for oil filled, remote electronics w/ brake
- MCBH5M** - SeaCon MCBH5M, bulkhead mount, no speed feedback signal, 50m 1-atmosphere only
- MCBH6M** - SeaCon MCBH6M, bulkhead mount, digital or analog speed signal, 50m 1-atm. only
- MCIL5M** - SeaCon MCIL5M, cable end, no speed feedback signal, 50m 1-atmosphere only
- MCIL6M** - SeaCon MCIL6M, cable end, digital or analog speed feedback signal, 50m 1-atm. only

for technical details on the referenced connectors please go to www.seaconworld.com, www.subconn.com & www.impulse-ent.com

XX - Cable Length Option (Does not apply to MCBH style connectors)

XX - Cable Length in X.X meters - leave as XX if no cable installed

DD - Material of All Wetted Metallic Surfaces Option

- AL** - 6061-T6 Aluminum, Hard Anodized Black
- SS** - Type 316 Stainless Steel, Passivated
- TI** - 6Al4V Titanium

EEEE - Remote Electronics Option (oil filled, full ocean depth) or Internal Electronics (50m depth)

- HPFX** - Remote Electronics, Flat mount in customer 1-Atm. Housing, Oil filled full ocean depth actuator
- HPRX** - Remote Elec., Round mount in customer 1-Atm. Housing, Oil filled full ocean depth actuator
- AMCL** - Remote Elec., 20-80vdc, AMC DPRALTE in 1-Atm. Housing, Oil filled full ocean depth actuator
- AMCH** - Remote Elec., 40-190vdc, AMC DPRALTE in 1-Atm. Housing, Oil filled full ocean depth actuator
- INTX** - Internal Electronics, 1-Atmospher actuator, 150 fsw (50m) max. depth, +/-5v analog control only

or technical details on the referenced AMC controllers, please go to www.A-M-C.com

Y - Internal Brake Option

- B** - Internal Brake Fitted
- Y** - No Internal Brake

WHAT WERE YOU DOING 30 YEARS AGO?

In 1985 Tecnadyme delivered its first thrusters, six Model 1020's that were installed on the original RTV-500 built by Mitsui Engineering & Shipbuilding (MES) of Tokyo. Since that time, we have manufactured and delivered over 6,000 thrusters, including more than 600 of the Model 1020. And even though the Model 1020 that we build today incorporates over 32 design revisions to improve reliability, efficiency and maintainability – that thruster is still 100% compatible with the Model 1020 that was installed on that first RTV-500 system more than 30 years ago. This means that, after 30+ years, MES (or any of our customers) can still purchase or repair a Model 1020 thruster to keep its fleet of ROV's working. And in those 30 years, the Model 1020 thruster has powered vehicles to the Titanic, that discovered JFK's PT-109 in the Pacific, that participated in record depth wellhead completions off the coast of West Africa, that discovered lost cities in the Black Sea, that have scoured the world's oceans for mines, and that have successfully completed thousands of routine subsea missions. And the Model 1020 thruster is still being installed on new ROV and AUV systems worldwide.

And, like the Model 1020, Tecnadyme's twenty-one other thruster models have also served the offshore community with reliability, high performance and cost effectiveness – but none for quite as long as the Model 1020's 30 years. Tecnadyme is constantly developing and releasing new thruster models, with 4 new models released in 2010 and 4 models being released in 2013.

It is Tecnadyme's commitment to its customers and to the subsea community that no vehicle system, be it an ROV, an AUV, a manned submersible or any other subsea system, will ever be made obsolete because the Tecnadyme thrusters installed on that system are no longer available for a reasonable and competitive price.

So, for your next ROV, AUV or manned submersible build or purchase, be sure to specify only genuine Tecnadyme thrusters. You, your operators, your technicians and your customers will be glad you did – for the next 30 years.

QUALITY ASSURANCE

Tecnadyme operates under a Quality Plan that is fully ISO 9001:2008 compliant. All electrical soldering is performed by technicians certified to the IPC J-STD-009 & IPC-A-610 standards.

FINAL TEST & INSPECTION

All Tecnadyme products undergo a rigorous set of final test procedures. Each thruster is operated at reduced power and full power in both directions for extended time periods. Each thruster is pressure tested and then subjected to an insulation breakdown test to identify leaks or other problems. Prior to shipment to the customer, each thruster is certified to perform correctly and to factory specifications.

EXPRESS LIMITED WARRANTY

Subsea thruster motors manufactured by Tecnadyme are warranted to the original Purchaser for a period of one year from the date of shipment from the factory to conform to Tecnadyme's specifications at the time of purchase and to be free of mechanical, electrical and physical defects in material and workmanship if the products have been installed, electrically connected, operated and serviced in accordance with Tecnadyme's instructions as listed in the Operations & Maintenance Manual accompanying the thrusters.

Except for the express warranty set forth herein, Tecnadyme makes no other warranties or guarantees, express, oral, implied or statutory, regarding its subsea thruster products. All such warranties are expressly disclaimed to the extent allowable by law.

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9770 Carroll Centre Road, Suite C
San Diego, CA 92126, USA
Voice & Fax: 1-858-586-9660

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