



- Field proven 5kw thruster develops over 210lbf (95 kgf) forward thrust & over 75lbf (34kgf) reverse thrust.
- Powerful DC brushless motors built to the ISO 9001:2008 quality standard.
- Magnetically coupled propeller drive eliminates all rotating shaft seals for optimum reliability.
- Custom designed high efficiency propeller & Kort nozzle for maximum Bollard thrust.
- Investment cast Type 316 stainless steel propeller is available in both RH and LH rotation.
- 6.7/1 ratio planetary gearbox & high rpm motor for extremely high efficiency & light weight.
- Available with +/-5v analog or RS485 closed loop speed control.
- Rated to 2,800 ft (850m) depth with 1 atmosphere housings or full ocean depth with oil filled, pressure balanced housings.
- Available with hard anodized 6061-T6 aluminum, Type 316 stainless steel or 6Al4V titanium housings.
- Available with motors for 48vdc, 70vdc, 150vdc, 260vdc or 330vdc. Other voltages optional.

Bollard Output

210lbf (95kgf) forward, 75lbf (34kgf) reverse, w/ either RH or LH stainless steel propellers.

Input

5kw at 48vdc, 70vdc, 150vdc, 260vdc or 330vdc, +/-5v analog speed control or RS485 speed control.

Weight

22.5-32lbs (10.2-14.5kg) in air, 17-24lbs (7.7-11kg) in water, depending on configuration.

Depth Rating

2,800ft (850m) standard with 1 atm housings, full ocean depth when pressure balanced oil filled.
(specifications subject to change without notice)

Introduction

One of Tecnadyne's legacy thrusters, the Model 2010 uses a custom designed, highly efficient propeller and Kort nozzle to easily exceed 95kg forward thrust. Field proven for over 25 years in the harsh off-shore environment, the Model 2010 is now supplied primarily in support of existing systems. The more efficient Model 2020 thruster is recommended for new designs. More than 200 Model 2010's have been delivered to customers worldwide, and it is still proving it's worth on work class ROV's, AUV's, manned submersibles and other subsea installations requiring high thrust, light weight and exceptional reliability.

Magnetic Propeller Coupling

As with all Tecnadyne thrusters, the propeller of the Model 2010 is magnetically coupled. With this design, a magnet array is fitted inside the hub of the propeller; and this magnet array is driven by a matching magnet array attached to the motor and gearbox inside the sealed pressure vessel. By eliminating the rotating drive shaft and shaft seals that always seem to leak over time, the Model 2010 achieves extremely high reliability. Additionally, the magnetic coupling will ratchet if overloaded, preventing damage caused by objects jammed in the propeller. And since the water lubricated propeller bearings are external to the pressure housing, they can be easily replaced in a matter of minutes.

High RPM Motor & Planetary Gearbox

The Model 2010 uses DC brushless motors that are manufactured to the ISO 9001:2008 quality standard. These high RPM, low inertia motors are coupled to 6.7/1 ratio planetary gearset, assembled using hardened, high precision spur gears. This motor / gearbox combination delivers maximum reliability, efficiency and power in an extremely compact, lightweight and easy to maintain package.

Highly Efficient Propeller & Nozzle

The high efficiency Type 316 stainless steel propeller is available in both right and left hand rotations and is precision investment cast in a U.S foundry. With a

Kort nozzle optimized for Bollard thrust, it is a powerful yet extremely compact package.

Depth Rating Options

The standard configuration is rated to 850m depth and places the electronics controller within the 1 atmosphere motor housing. For full ocean depth rating, the electronics module is installed in a remote, one atmosphere housing (either the customer's housing or one supplied by Tecnadyne) and the thruster is oil filled and pressure balanced using electrical cabling of flexible Tygon tubing.

Voltages Supported

The Model 2010 is available for operation at voltages of 48vdc, 70vdc, 150vdc, 260vdc (standard) and 330vdc. 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.

RS485 or Analog Speed Control

Two speed control options are available for the Model 2010. The controller is jumper selectable for either closed loop multi-mode RS485 speed control or for +/-5v analog speed and direction control. In addition, the thruster can be supplied with separate enable and water detect lines.

Other Options

Optional configurations include: five available buss voltage choices; housings made from hard anodized aluminum (standard), Type 316 stainless steel or 6Al4V titanium; three mounting styles, including saddle mount, blade mount and tab mount; several bulkhead type or cable end subsea connectors; RH or LH rotation propellers; and a nozzle inlet screen.

Please note that the specifications are subject to change without notice. Additionally, Model 2020 thrusters for operation to depths greater than 1,000 meters are subject to U.S. Government export controls.

Go to www.tecnadyne.com

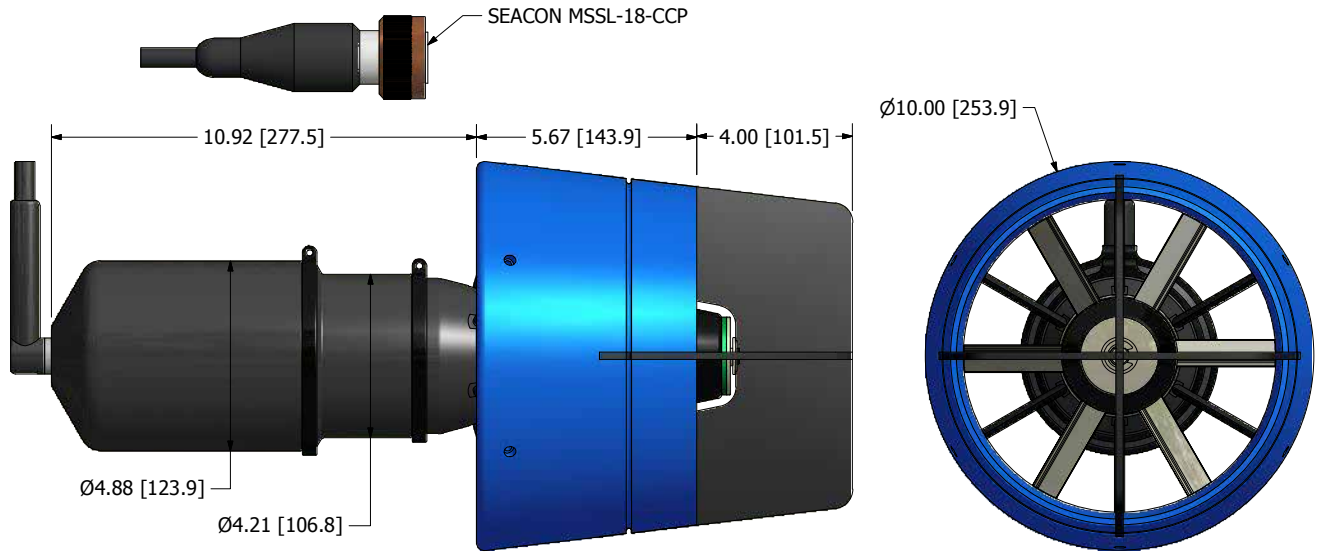


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MODEL 2010

2010-AAA-MSSL18CCP-2.0-0850-AL-SCLX-SM-G-RH-BK



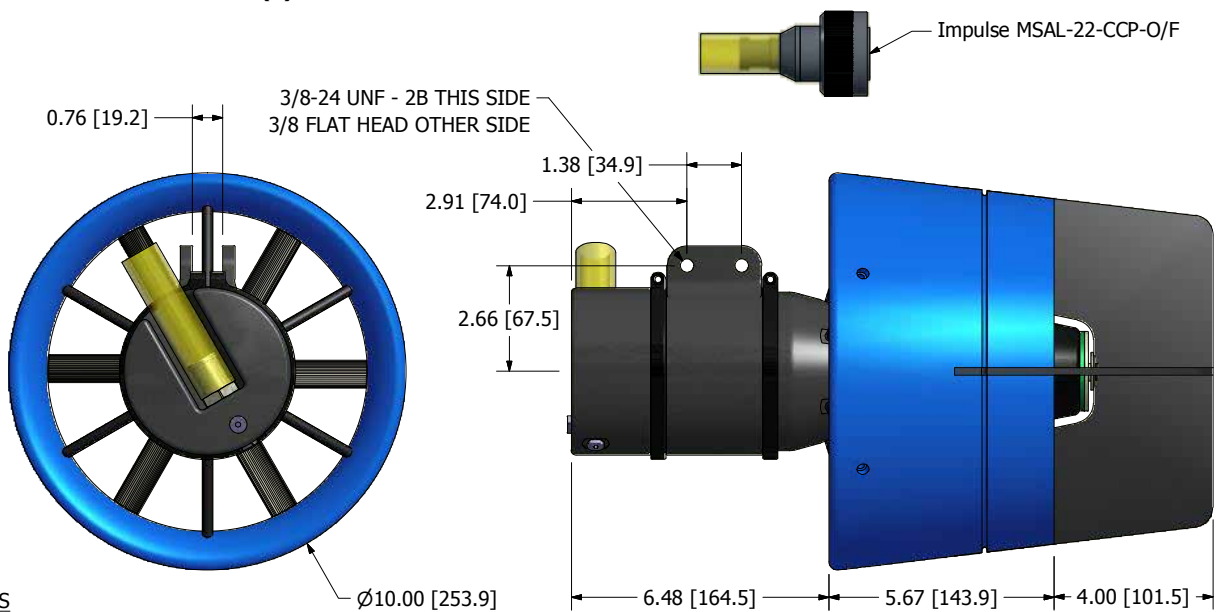
WEIGHTS
 25lb [11.4kg] in air
 19lb [8.7kg] in water

SCALE 1:5

Download STP solid model of this thruster here:
<http://www.tecnadyne.com/thrusters>

MODEL 2010

2010-AAA-MSAL22CCP-XX-FOD-AL-RP(B)OF-BM-G-RH-UK



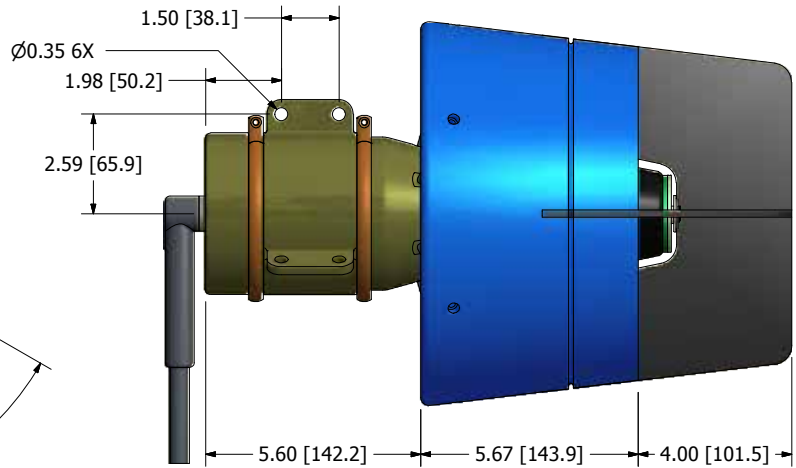
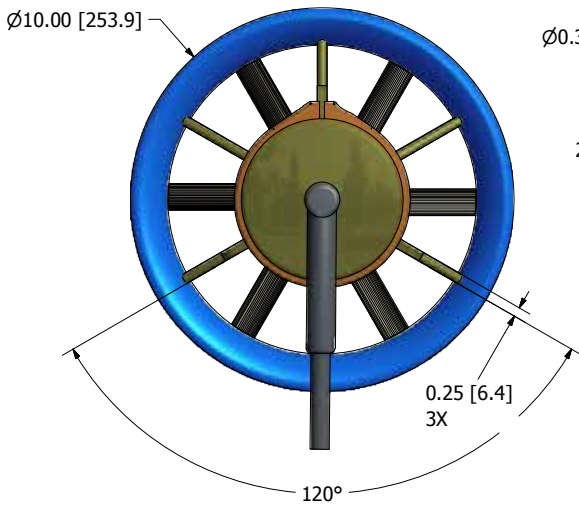
WEIGHTS
 22.5lb [10.2kg] in air
 17lb [7.7kg] in water

SCALE 1:5

Download STP solid model of this thruster here:
<http://www.tecnadyne.com/thrusters>

MODEL 2020

2020-AAA-XSL6ACCP-XX-0850-AL-RP(B)OF-TM-G-RH-BK



WEIGHTS
 26lb [11.8kg] in air
 19.5lb [8.9kg] in water

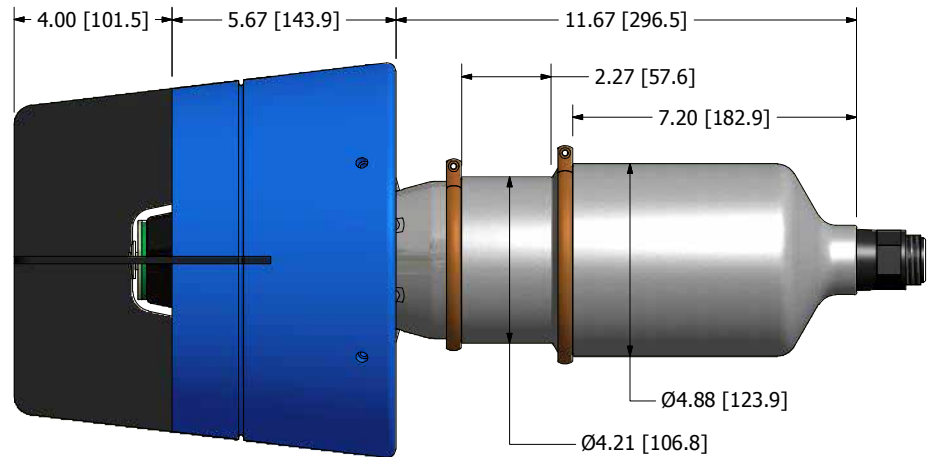
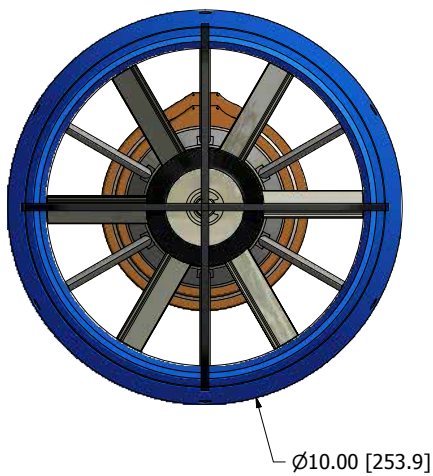


SCALE 1:5

Download STP solid model of this thruster here:
<http://www.tecnadyne.com/thrusters>

MODEL 2010

2010-AAA-XSL6ABCR-XX-0850-SS-SCLX-SM-G-LH-UK



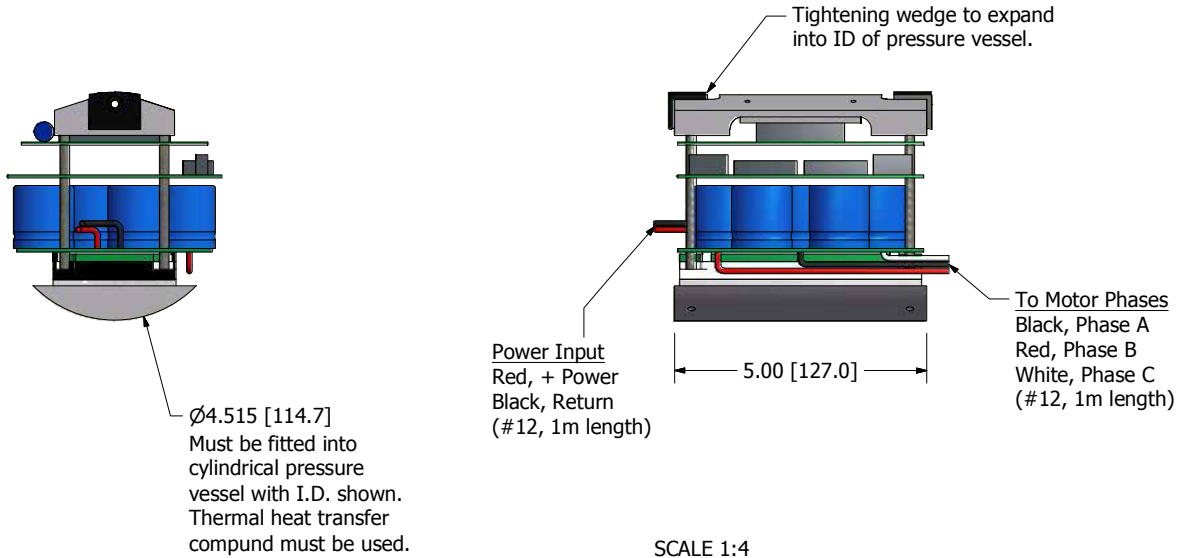
SCALE 1:5

WEIGHTS
 32lb [14.6kg] in air
 24lb [11kg] in water

Download STP solid model of this thruster here:
<http://www.tecnadyne.com/thrusters>

REMOTE ELECTRONICS MODULE, POD CONFIG

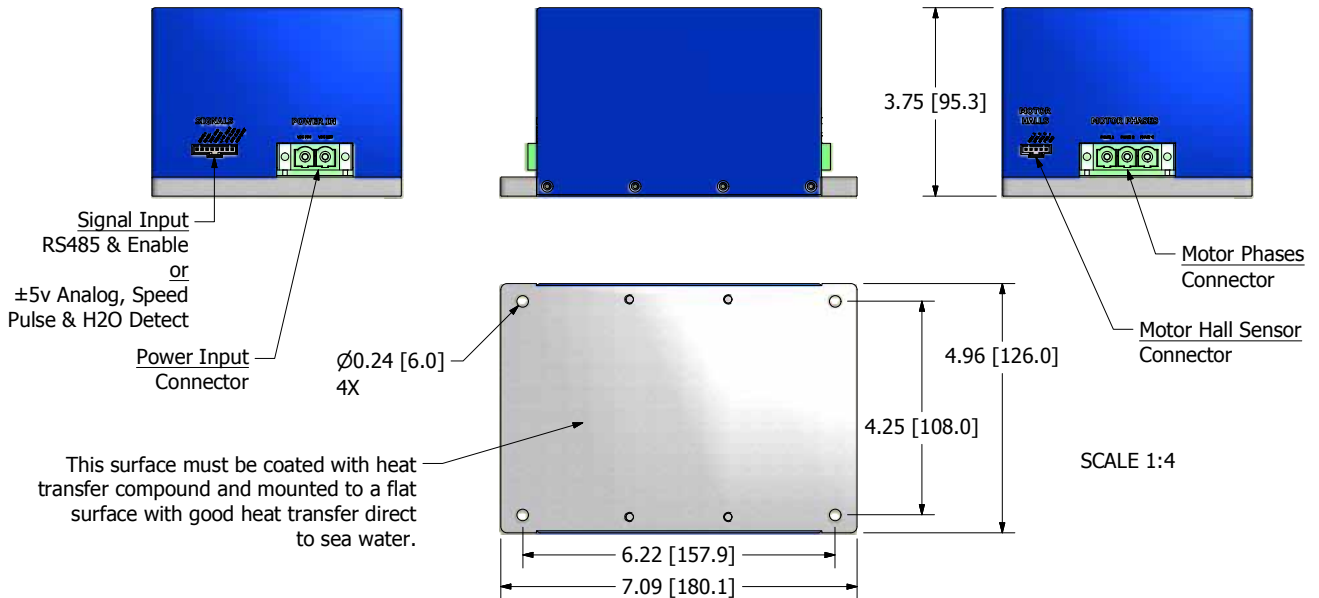
USED IN **RPLX** & **RPOF** CONFIGURATIONS & INSTALLED IN CUSTOMER FURNISHED PRESSURE VESSEL.



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

REMOTE ELECTRONICS MODULE, BLOCK CONFIG.

USED IN **RBXL** & **RBOF** CONFIGURATIONS & INSTALLED IN CUSTOMER FURNISHED PRESSURE VESSEL



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

2010 - AAA - BBBB - XX - CCCC - DD - EEEE - FF - G - HH - JJ

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

048 - 48vdc

070 - 70vdc

150 - 150vdc

260 - 260vdc

330 - 330vdc

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

MSA(S)L8CCP - Impulse MSA(S)L-8-CCP-O/F, oil filled tubing, **RPOF** or **RBOF**, 150vdc or higher

MSA(S)L8BCR - Impulse MSA(S)L-8-BCR, bulkhead mount, for **RPLX** or **RBLX**, 150vdc or higher

MSA(S)L18CCP - SeaCon MSA(S)L-18-CCP, cable end, for **SCLX**, **RPLX** or **RBLX**, all voltages

MSA(S)L18BCR - SeaCon MSA(S)L-18-BCR, bulkhead mount, for **SCLX**, **RPLX** or **RBLX**, all voltages

MSA(S)L22CCP - Impulse MSA(S)L-22-CCP-O/F, oil filled tubing, **RPOF** or **RBOF**, all voltages

XSL6ACCP - SeaCon XSL-6A-CCP, cable end, for **SCLX**, 260 or 330vdc

XSL6ABCR - SeaCon XSL-6A-BCR, bulkhead mount, for **SCLX**, 260 or 330vdc

XSL12CCP - SeaCon XSL-12-CCP, cable or oil filled tubing, for all configurations, 260 or 330vdc

XSL12BCR - SeaCon XSL-12-CCP, bulkhead mount, **SCLX**, **RPLX** or **RBLX**, 260 or 330vdc

for technical details on the referenced connectors

please go to www.seaconworld.com & www.impulse-ent.com

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

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

CCCC - Maximum Operating Depth Option

0850 - 850 meters (2800 ft)

FOD - Full Ocean Depth (Requires Oil Filled Pressure Compensated option, above)

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 - Self Contained or Remote Electronics Option

SCLX - Self Contained Electronics (electronics in housing with motor)

RPLX - Remote Electronics, POD configuration electronics, 1 Atmosphere Motor Housing

RBLX - Remote Electronics, Block configuration electronics, 1 Atmosphere Motor Housing

RPOF - Remote Electronics, POD configuration elox, Oil Filled Pressure Compensated Motor Housing

RBOF - Remote Electronics, Block configuration elox, Oil Filled Pressure Compensated Motor Housing

FF - Mounting Option

SM - Saddle Mount

BM - Blade Mount

TM - Tab Mount

G - Control Signal Option

A - +/-5v Analog Control Signal

R - RS485 Control Signal

HH - Propeller Handing Option

RH - Right Hand

LH - Left Hand

JJ - Nozzle Options

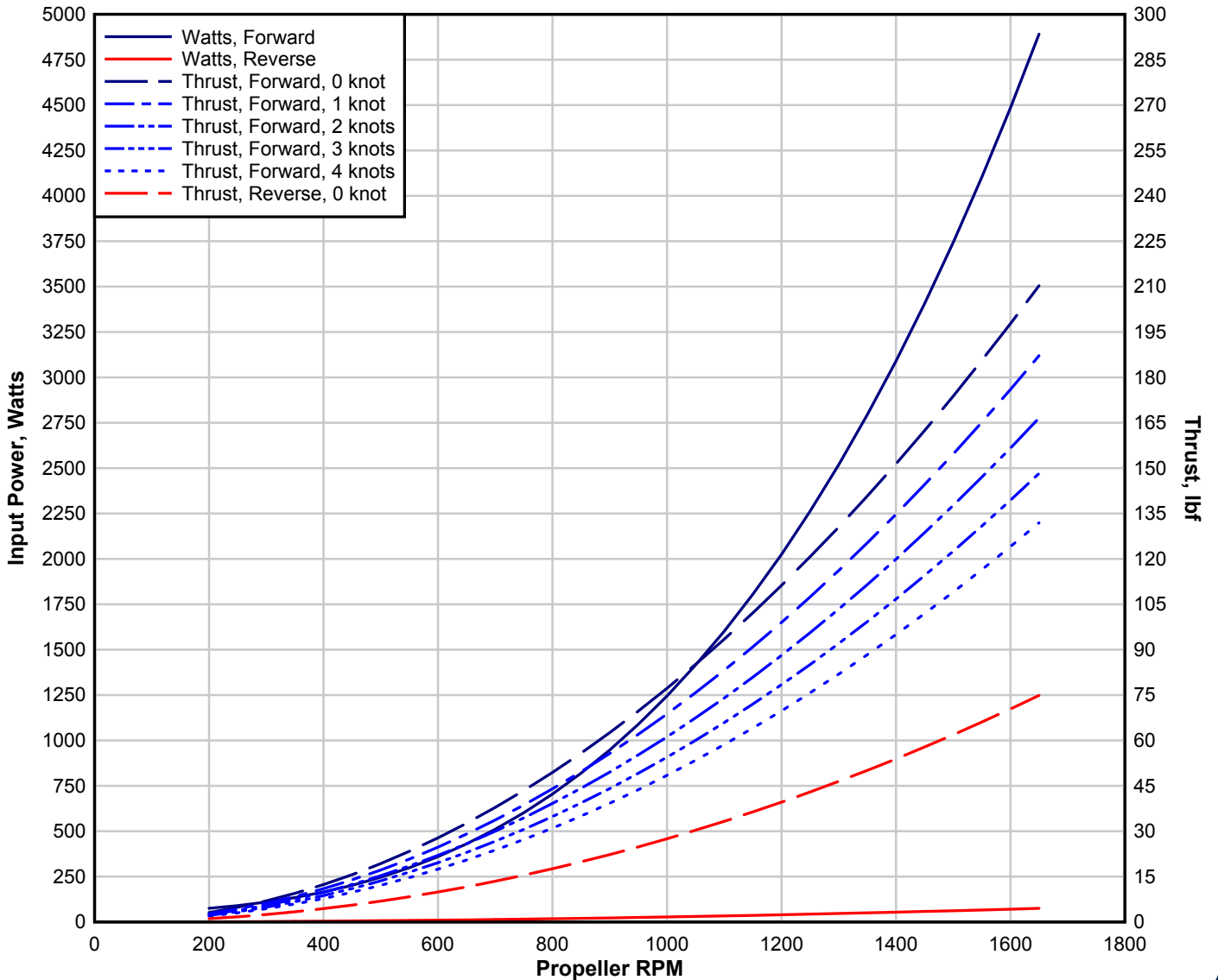
BK - Black

UK - Blue (extra cost option)

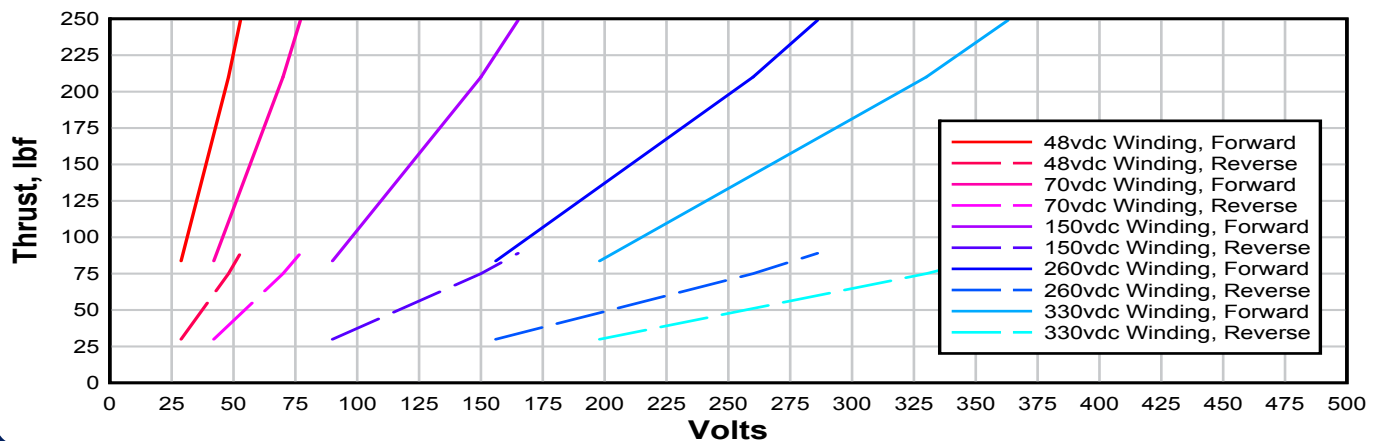
BS - Black with Inlet Screen (extra cost option)

US - Blue with Inlet Screen (extra cost option)

Model 2010 Thruster
Input Power & Thrust vs. Propeller RPM



Model 2010 Thruster
Thrust vs. Voltage Change



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.

BUILT WITH PRIDE



IN THE U.S.A.



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