

MODEL 560

DC BRUSHLESS THRUSTERS

The Model 560 has become the thruster of choice for light duty inspection class ROV's and is used by many OEM's worldwide. With over 2,000 units in the field, the Model 560 has proven reliability and durability combined with low life cycle cost. Using a high speed brushless motor, the Model 560 uses a planetary gearbox to drive the propeller through Tecnadyne's signature magnetic coupling.

BOLLARD THRUST

37lbf (17kgf) forward, 22lbf (10kgf) reverse,
RH & LH stainless steel propeller options

INPUT

1kw input power
Voltage options
between 48vdc - 330vdc
+/-5v analog or RS485 digital speed
control

WEIGHT

4 - 6lbs (1.8 - 2.7kg) in air
3 - 5lbs (1.4 - 2.3kg) in water
(Depending on configuration)

DEPTH RATING

2,800ft (850m), 3,300ft (1000m) &
5,000ft (1'500m) with 1 atm housings.
Full ocean depth when oil filled
(PBOF - equires remote electronics)

CONSTRUCTION

Available with hard anodized 6061-T6 aluminum.
Type 316 stainless steel
or 6Al4V titanium housings



TECNADYNE[®]
THE LEADER IN SUBSEA PROPULSION

ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Visit www.tecnadyne.com for product datasheets

9770 CARROLL CENTRE RD., SAN DIEGO, CA 92126 | SALES@TECNADYNE.COM | 858-586-9660

MODEL 560 DESCRIPTION

MAGNETIC PROPELLER COUPLING

As with all Tecnadyne thrusters, the propeller of the Model 560 is magnetically coupled. With this design, a magnet array is fitted inside the hub of the propeller and is driven by a matching magnet array attached to the motor inside the sealed pressure vessel. By eliminating the rotating drive shaft and shaft seals that invariably leak over time, the Model 560 achieves extremely high reliability. Additionally, the magnetic coupling will ratchet if overloaded, preventing damage caused by objects jammed in the propeller. Since the water lubricated propeller bearings are external to the pressure housing, they can be easily replaced in a matter of minutes.

HIGH EFFICIENCY DC BRUSHLESS MOTOR

The Model 560 uses DC brushless motors that are manufactured to the ISO 9001:2015 quality standard. These high RPM, low inertia motors are coupled to 6/1 ratio planetary gearset, assembled using hardened, high precision spur gears. This motor/gearbox combination delivers maximum reliability and power in an extremely compact, lightweight, and easy to maintain package.

HIGH POWER DENSITY PROPELLER & NOZZLE

The high efficiency Type 316 stainless steel propeller is available in both right and left hand rotations and is precision investment cast by a U.S foundry. With a Kort nozzle for Bollard thrust, it delivers 25% more thrust and 20% higher efficiency compared to the older Model 520.

DEPTH RATING OPTIONS

The standard configuration is rated to 850m depth and places the electronics controller within the 1-atmosphere motor housing. An extra cost option, using special pressure components, is rated to 1,500m using self-contained electronics in the motor's 1-atmosphere housing. For greater depths, up 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) The thruster is oil filled and pressure balanced using electrical cabling of flexible PVC tubing with a maximum tubing length of 10m.

VOLTAGES SUPPORTED

The Model 560 is available for operation at specific voltages between 48 VDC and 330 VDC. 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. See Tecnadyne application notes for details on thruster integration.

RS485 OR ANALOG SPEED CONTROL

Two speed control options are available for the Model 560. 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 seperate enable and water detect lines.

MODEL 561 OPTION

The Model 561 has an extended housing and carries back-EMF filtering capacitors . The capacitors reduce the requirement for external back-EMF filtering. The Model 561 performance is identical to the Model 560.

OTHER OPTIONS

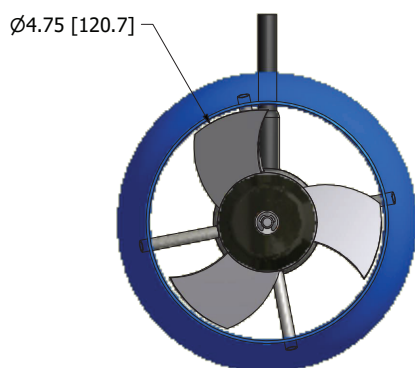
Optional configurations include: Eleven available buss voltage choices. Housings made from anodized aluminum (standard), Type 316 stainless steel or 6Al4V titanium; three mounting styles, including saddle mount, blade mount, and tab mount. Several bulkhead types or cable end subsea connectors , RH or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

MODEL 560

REPRESENTATIVE CONFIGURATIONS

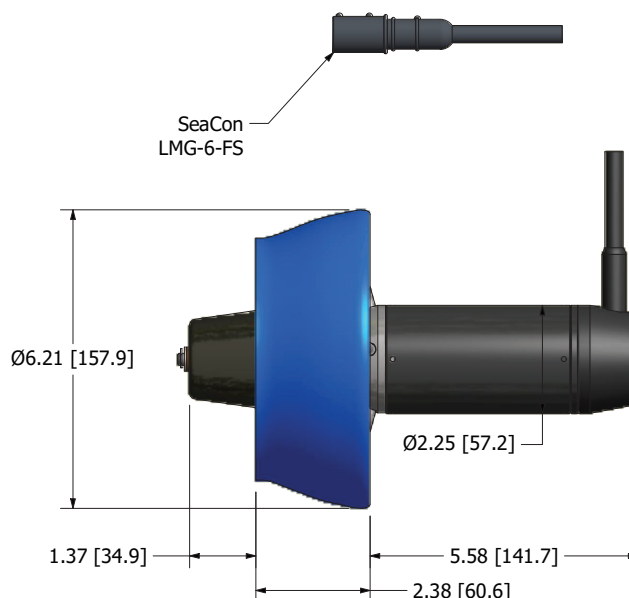
MODEL 560

560-AAA-LMG6FS-XX-0850-AL-SCLX-SM-R-RS-BK



WEIGHTS

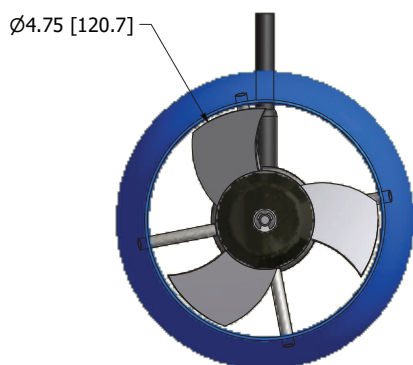
4.2lb [1.9kg] in air
3lb [1.4kg] in water



SCALE 1:4

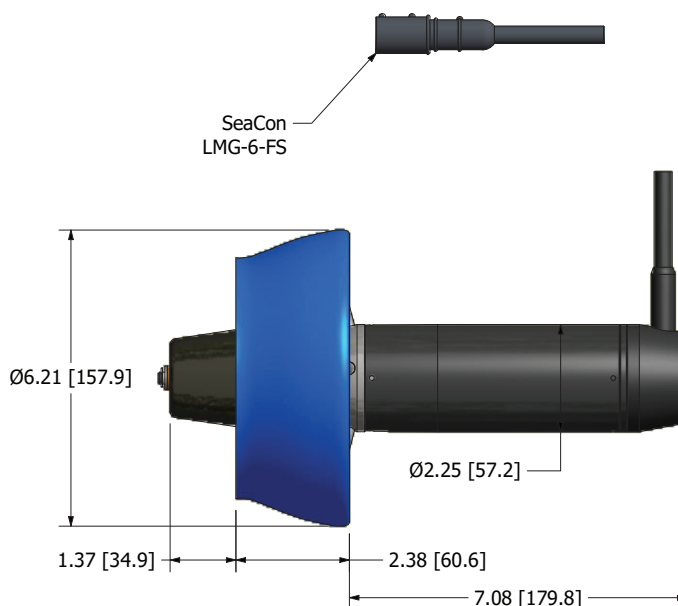
MODEL 561

561-AAA-LMG6FS-XX-0850-AL-SCLX-SM-R-RS-BK



WEIGHTS

4.7lb [2.1kg] in air
3.5lb [1.6kg] in water



SCALE 1:4

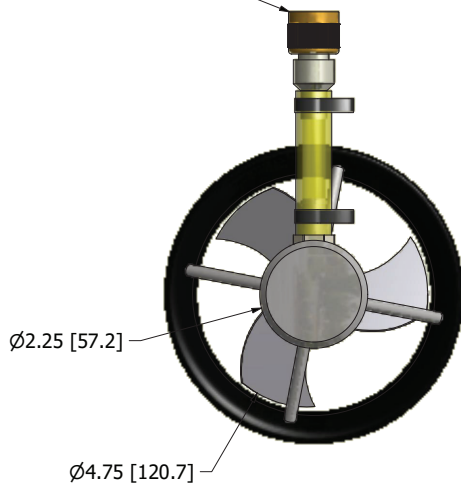
MODEL 560

REPRESENTATIVE CONFIGURATIONS

MODEL 560

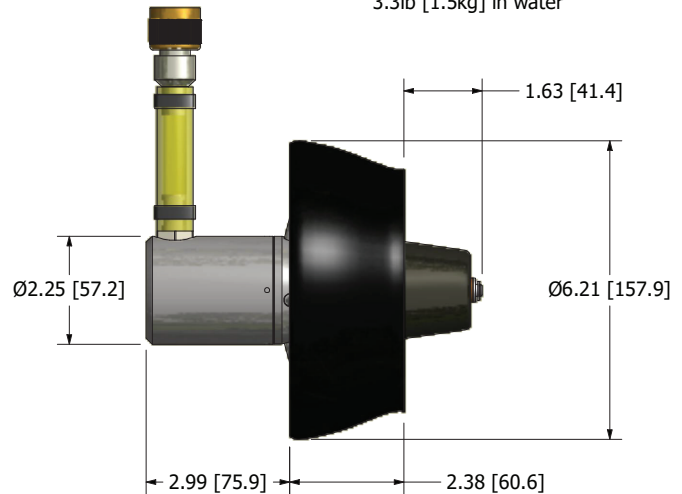
560-AAA-MHDG8CCPOF-XX-CSD-SS-HPF(R)X-SM-R-RS-BK

Impulse MHDG-8-CCPOF



WEIGHTS

4.3lb [1.9kg] in air
3.3lb [1.5kg] in water

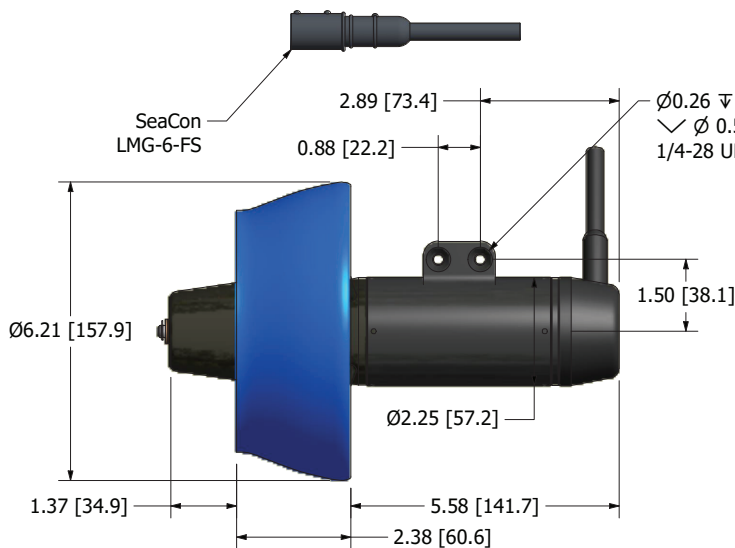


SCALE 1:4

MODEL 560

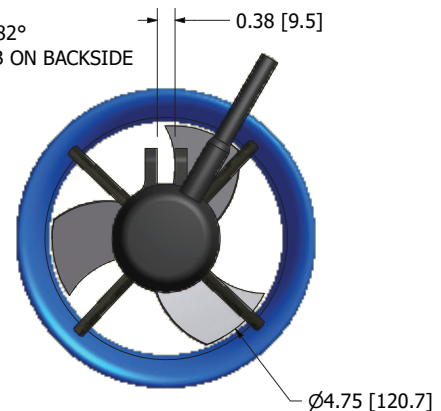
560-AAA-LMG6FS-XX-1000-AL-SCLX-BM-R-RS-BK

SeaCon
LMG-6-FS



WEIGHTS

4.3lb [1.9kg] in air
3.3lb [1.5kg] in water



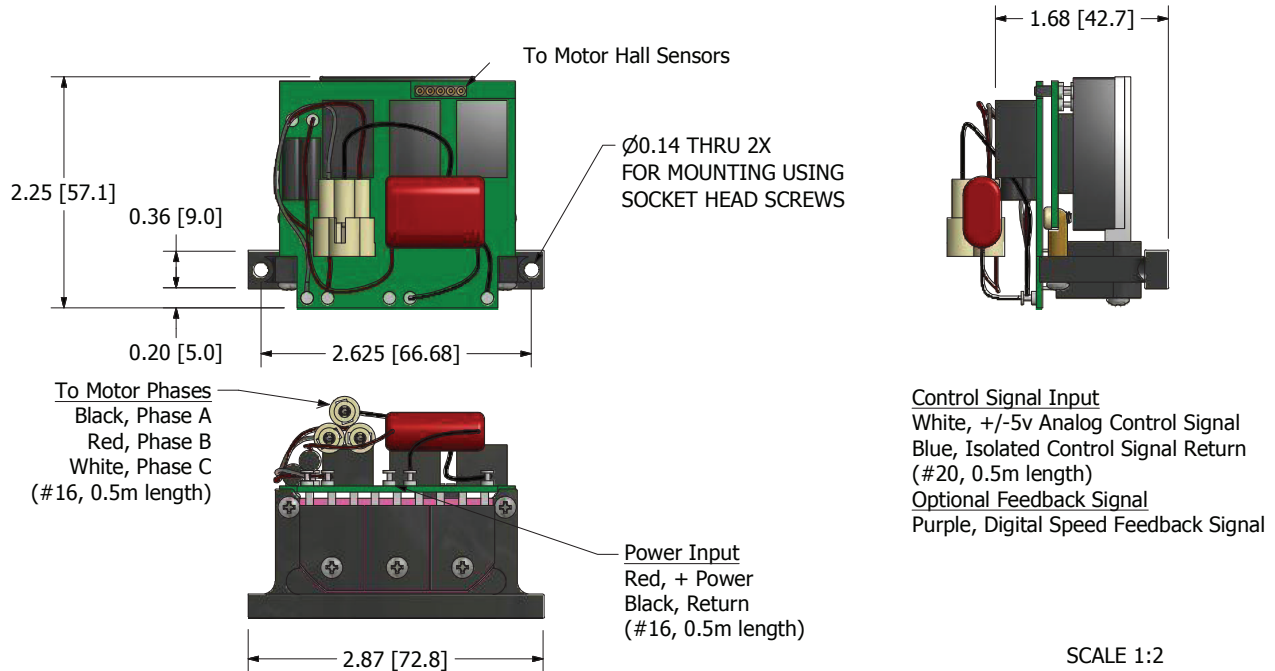
SCALE 1:4

MODEL 560

REMOTE ELECTRONICS OPTIONS

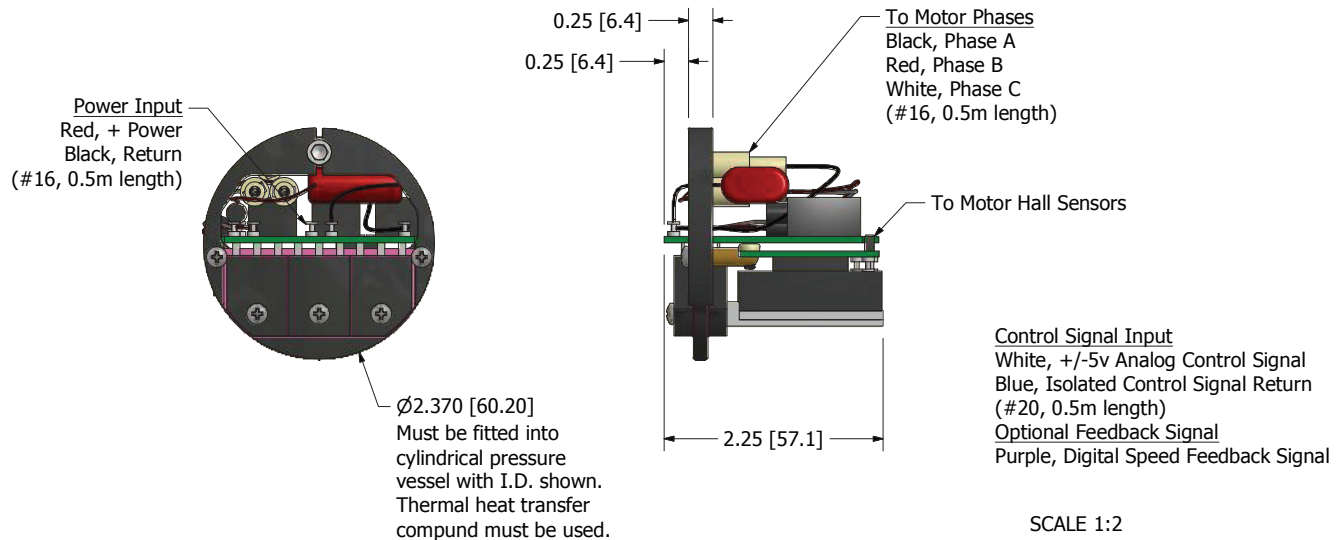
HPFX ELECTRONICS CONFIGURATION

USED IN HPFX CONFIGURATION & REQUIRES INSTALLATION IN 1ATM PRESSURE VESSEL.



HPRX BLOCK ELECTRONICS CONFIGURATION

USED IN HPRX CONFIGURATION & REQUIRES INSTALLATION IN 1ATM PRESSURE VESSEL.



MODEL 560

SPECIFICATIONS

MODEL 560 - PERFORMANCE AT DIFFERENT VOLTAGES

NOMINAL VOLTAGE	48	60	75	100	150	200	260	330
INPUT VOLTAGE RANGE	40-56	50-70	60-90	75-125	125-175	175-225	230-290	300-360
INPUT CURRENT	20	17	13	10	6.5	5	3	3
MAXIMUM INPUT POWER	960	1000	975	1000	975	1000	780	990
PEAK FORWARD	34	35	35	37	37	37	34	40
PEAK REVERSE BOLLARD	20	20	20	21	21	21	19	22
PROPELLER RPM	3100	3120	3125	3150	3150	3150	3100	3250

ANALOG CONTROL DRIVER SPECIFICATIONS (RPLX, RBLX)

DESCRIPTION	UNITS	VALUE
ISOLATED INSTRUMENTATION POWER	VDC mA	NOT REQUIRED
CONTROL SIGNAL (2)	VDC	+/-5
SPEED OUTPUT (OPTIONAL)	-	12V AMPLITUDE PULSE
SPEED OUTPUT FREQUENCY RANGE	-	0-1200
COMMUTATION TYPE	Hz	TRAPEZOIDAL
COMMUTATION FEEDBACK SENSORS	-	HALL SENSORS
SWITCHING FREQUENCY	kHz	20
PROTECTIONS	-	PULSE BY CURRENT LIMITING

MODEL 560

SPECIFICATIONS

RS-485 REMOTE DRIVER SPECIFICATIONS (SCLX, RPLX, RBLX)

DESCRIPTION	UNITS	VALUE
BAUD RATES SUPPORTED	kbps	9.6-115
ISOLATED INSTRUMENTATION POWER	VDC mA	NOT REQUIRED
CONTROL SIGNAL OPTION (2)	VDC	+/-5
SPEED OUTPUT	-	5-12VDC PULSE,
SPEED OUTPUT FREQUENCY RANGE	Hz	0-7200
CLOSED LOOP CONTROL	-	VELOCITY LOOP
COMMUTATION TYPE	-	TRAPEZOIDAL
COMMUTATION FEEDBACK SENSORS	-	HALL SENSORS
SWITCHING FREQUENCY		20
PROTECTIONS	-	MOTOR OVER-TEMPERATURE SHUTDOWN PULSE BY PULSE CURRENT LIMITING
FEEDBACKS VIA RS-485 (SEE COMMUNICATIONS MANUAL FOR DETAILS)		INPUT VOLTAGE, INPUT CURRENT, SPEED, DIRECTION ELECTRONICS TEMPERATURE, MOTOR TEMPERATURE, POWER ON TIME

NOTES:

1. DC Brushless Thrusters are not constant power devices. Voltages above nominal rating will result in increased speed, thrust and power draw. Ensure maximum input power is not exceeded by reducing speed command and its voltages above nominal. If thruster is operated above maximum power rating, damage may occur. Conversely, the thruster can be operated at voltages below nominal, however will result in decreased maximum speed, thrust and power draw. Oil filled thrusters may require more input power at depth due to viscosity changes in the oil.
2. Analog control signal dictates speed and direction of the unit. Typically, a voltage of +/-4.70Vdc will give maximum speed (100% PWM command.) See final test report for exact start and stop voltage. RS-485 remote drivers have the option of speed command via serial or analog control. Serial feedback is available if analog control mode is used.

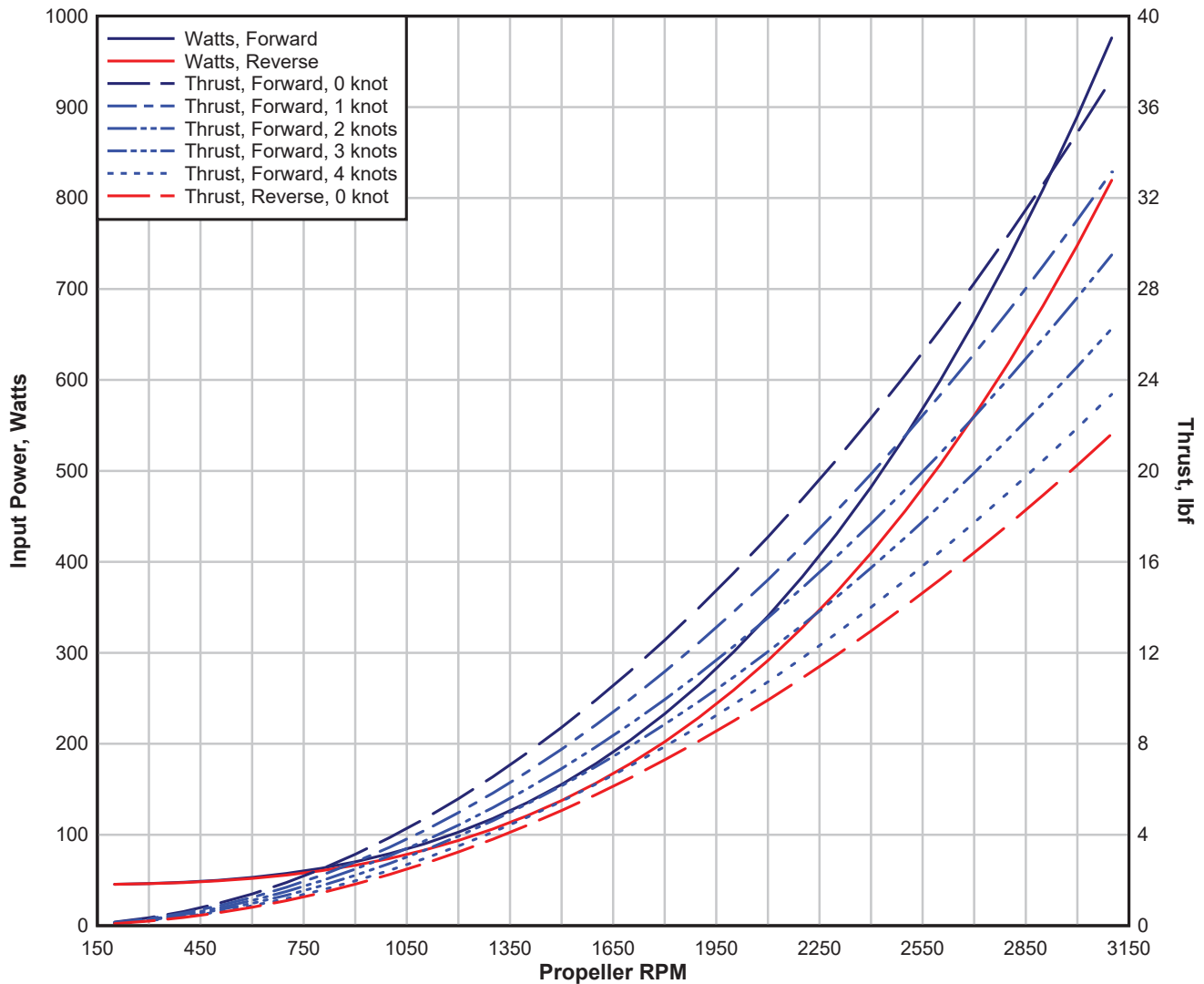
MODEL 560 & 561 CONFIGURATION & PART NUMBERING

560 (561)-AAA-BBBBBB-XX-CCCC-DD-EEEE-FF-G-HH-JJ

AAA NOMINAL VOLTAGE OPTION (CONSULT FACTORY FOR OTHER VOLTAGES)	<ul style="list-style-type: none"> 048 - 48VDC 060 - 60VDC 075 - 75VDC 100 - 100VDC 	<ul style="list-style-type: none"> 150 - 150VDC 200 - 200VDC 260 - 260VDC 330 - 330VDC
BBBBB SUBSEA CONNECTOR OPTION (CONSULT FACTORY FOR OTHER CONNECTORS)	<ul style="list-style-type: none"> LMG6FS - SEACON, CABLE END, SCLX ONLY MCIL5M - SEACON, CABLE END, NO SPEED FEEDBACK, SCLX ONLY MCIL6M - SEACON, CABLE END, SCLX ONLY MCBH5M - SEACON, BULKHEAD, NO SPEED FEEDBACK, SCLX ONLY 	<ul style="list-style-type: none"> MCBH6M - SEACON, BULKHEAD, SCLX ONLY IL6M - SEACON, BULKHEAD, SCLX ONLY MHDG8CCP - IMPULSE, OIL FILLED TUBE, HPFX & HPRX ONLY MCPBOF8M - SUBCONN, OIL FILLED TUBE, HPFX & HPRX ONLY
XX CABLE LENGTH OPTION (DOES NOT APPLY TO BCR OR FCR CONNECTORS)	<ul style="list-style-type: none"> XX - CABLE LENGTH IN METERS (LEAVE AS XX IF NO CABLE INSTALLED) 	
CCCC MAXIMUM OPERATING DEPTH OPTION	<ul style="list-style-type: none"> 0850 - 850 METERS (2,800FT) 1000 - 1000 METERS (3300FT) 1500 - 1,500 METERS (5,000 FT) 	<ul style="list-style-type: none"> CSD - CUSTOMER SPECIFIED DEPTH (REQUIRES REMOTE ELECTRONICS & OIL FILLED PRESSURE COMPENSATED OPTION FOR DEPTHS GREATER THAN 1,200M)
DD HOUSING MATERIAL OPTION	<ul style="list-style-type: none"> AL - 6061-T6 ALUMINUM, HARD ANODIZED BLACK SS - TYPE 316 STAINLESS STEEL, PASSIVATED 	<ul style="list-style-type: none"> TI - 6AL4V TITANIUM
EEEE SELF-CONTAINED OR REMOTE ELECTRONICS OPTION	<ul style="list-style-type: none"> SCLX - SELF-CONTAINED ELECTRONICS, 1200M MAX HPFX - REMOTE ELECTRONICS, FLAT SURFACE MOUNT HPRX - REMOTE ELECTRONICS, CYLINDER MOUNT 	
FF MOUNTING OPTION	<ul style="list-style-type: none"> SM - SADDLE MOUNT BM - BLADE MOUNT 	
G CONTROL OPTION	<ul style="list-style-type: none"> A - +/-5V ANALOG CONTROL R - RS485 CONTROL, MODEL 561 ONLY 	
HH PROPELLER HANDING OPTION	<ul style="list-style-type: none"> RS - RIGHT HAND, STAINLESS STEEL PROPELLER LS - LEFT HAND STAINLESS STEEL PROPELLER 	
JJ NOZZLE OPTIONS	<ul style="list-style-type: none"> BK - BLACK BS - BLACK WITH INLET SCREEN 	

MODEL 560 & 561 THRUST PERFORMANCE CURVES

Model 560 Thruster
Input Power & Thrust vs. Propeller RPM



Model 560 Thruster
Thrust vs. Voltage Change

