



**RIGMASTER**

## The Industry Standard for Five-Function Grabber Arms

***For nearly every TITAN 4 manipulator in the market, there is a RIGMASTER supporting the mission. The RIGMASTER's titanium construction makes it a durable and reliable in heavy-work class missions.***

- Structural Strength and Long Service Life
- Large Operating Envelope
- Highest Lift-to-Weight Ratio in its Class
- Interchangeable Jaw Configurations
- Boom Function Extends Arm Length by 305 mm (12 inches)
- Standard Depth Rating of 6,500 msw

The RIGMASTER is a five-function, rate-controlled, heavy-lift grabber arm that can be mounted on a wide range of subsea ROVs. The RIGMASTER is engineered for the strength needed to withstand the industry's harsh and repetitive needs day after day. The grabber arm can be used to grasp and lift heavy objects or to anchor the ROV by clamping the gripper around a structural member at the work site.

The RIGMASTER's boom function extends or retracts

the gripper by 305 mm (12 inches) for a maximum extension of 1,372 mm (54.0 inches). The system's standard four-finger intermeshing gripper can handle bulky objects by opening to 284 mm (11.2 inches).





The RIGMASTER is paired with an ORION manipulator arm on the Schilling QUEST™ ROV.

### DURABILITY

The RIGMASTER is constructed to be reliable in situations that require rugged operation. The arm's linear actuators have been life tested under full load for 250,000 cycles with minimal wear. The actuators use the latest cap seal technology to minimize leakage, ensuring long life and minimal maintenance. The RIGMASTER is constructed primarily of titanium for structural strength, light weight, corrosion resistance, and extraordinary resistance to damage from collisions. RIGMASTER manipulators have a proven track record of reliability in the world's most demanding subsea environments.

### LIFT-TO-WEIGHT RATIO

The RIGMASTER has the highest lift-to-weight ratio of any manipulator in its class. Weighing only 48 kg (105 lb) in



## RIGMASTER SPECIFICATIONS

### General Description

Control method ..... Rate control  
 Control input device ..... Optional rate hand controller  
 Number of functions ..... Four plus grip  
 Materials of construction ..... Titanium, anodized aluminum, 17-4 stainless steel,

### Manipulator Arm Specifications

All specifications are based on the standard system configuration using Shell Tellus® Oil 32 hydraulic fluid, input pressure of 207 bar (3,000 psi), and available flow of 19 lpm (5 gpm).

Depth rating ..... 6,500 msw (21,327 fsw)  
 Reach (from shoulder pivot to tip of standard gripper):  
     Retracted boom ..... 1,067 mm (42.0 in.)  
     Extended boom ..... 1,372 mm (54.0 in.)  
 Weight in air ..... 64 kg (142 lb)  
 Weight in seawater ..... 48 kg (105 lb)  
 Lift at full extension, nominal:  
     Retracted boom ..... 270 kg (595 lb)  
     Extended boom ..... 181 kg (400 lb)  
 Maximum standard gripper opening, nominal ..... 284 mm (11.2 in.)  
 Grip force, nominal ..... 4,448 N (1,000 lbf)  
 Wrist torque, nominal ..... 205 Nm (150 ft-lb)  
 Wrist rotate, continuous ..... 360 degrees, 6-35 rpm

### Manipulator Arm Functions

Actuator Function	Type	Nominal Mechanical Range
Base yaw	Linear	105 degrees
Shoulder pitch	Linear	105 degrees
Boom extend/retract	Linear	305 mm (12 in.)
Wrist rotate	Gerotor	360 degrees
Gripper, standard	Linear	284 mm (11.2 in.)

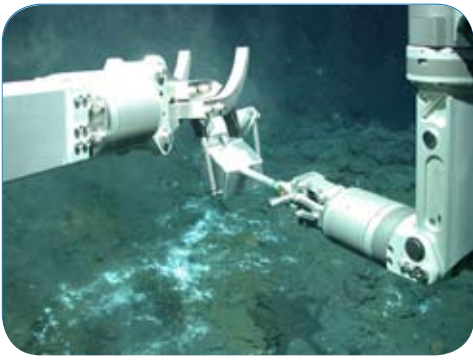
### Approved Hydraulic Fluids

Hydraulic oil ..... All common mineral, Glycol, and environmentally friendly fluids

### Hydraulic Requirements

Viscosity ..... 10-200 cSt  
 Available flow ..... 5.7-19.0 lpm (1.5-5.0 gpm)  
 Pressure ..... 103 bar (1500 psi) minimum to 207 bar (3,000 psi) maximum  
     Slave arm performance is reduced at less than 3000 psi.  
 Hydraulic fluid temperature, maximum ..... 54 degrees C (130 degrees F)  
 Rotary actuator return pressure, maximum ..... 24 bar (350 psi)  
 Filtration ..... 10 microns (25 microns absolute)

(Continued on next page)



The RIGMASTER working together with an ORION manipulator collecting scientific samples from the ocean floor.

Photo Courtesy of Marum

seawater, RIGMASTER's titanium linear actuators allow the manipulator to lift 270 kg (595 lb) when the boom is retracted and 181 kg (400 lb) at full arm extension. The wrist, which provides continuous 360-degree rotation, is driven by a high-torque, low-speed gerotor hydraulic motor that produces 170 Nm (125 ft-lb) of torque.

### SYSTEM CONFIGURATION

On an ROV, a RIGMASTER arm is typically paired with a dexterous manipulator arm such as a TITAN, CONAN, or ORION model. The standard arm is configured for left-hand installation, so that a dexterous arm can be mounted on the right. The RIGMASTER arm can be stowed vertically or horizontally to accommodate a range of ROV configurations. No electrical connections are required for the arm. Each joint or function is supplied by two hydraulic hoses that can be controlled with simple, customer-supplied valves and a switch box. An optional ergonomic rate hand controller is available for manipulator operation.

### SCHILLING MANIPULATOR COMPATIBILITY

To create the best manipulators on the market, Schilling took the best field-proven manipulator technologies and used them repetitively throughout the system. The result is a simple, reliable system with high component commonality that

(Specifications, continued from previous page)

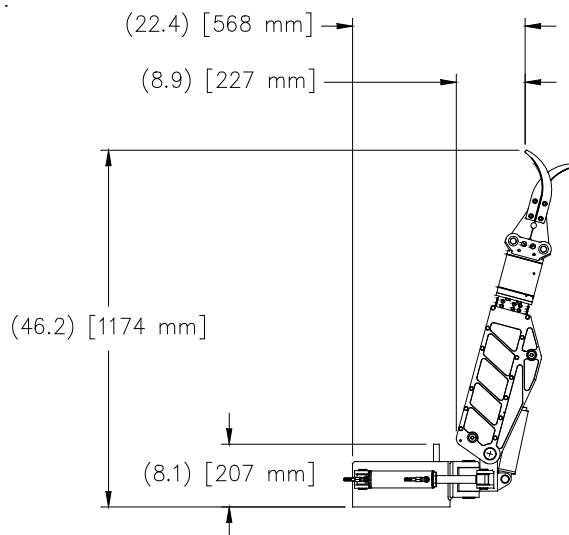
Hydraulic control hose length extending from base,	
nominal, all functions .....	55 inch (4.6 ft)
Control hoses:	
Working pressure .....	207 bar (3000 psi)
Proof pressure .....	310 bar (4500 psi)
Burst pressure .....	621 bar (9000 psi)
Customer-supplied mating fittings required,	
Control hose fittings .....	-4 JIC male, 1/4 inch

Contact the factory about operation with other pressures and flow rates.

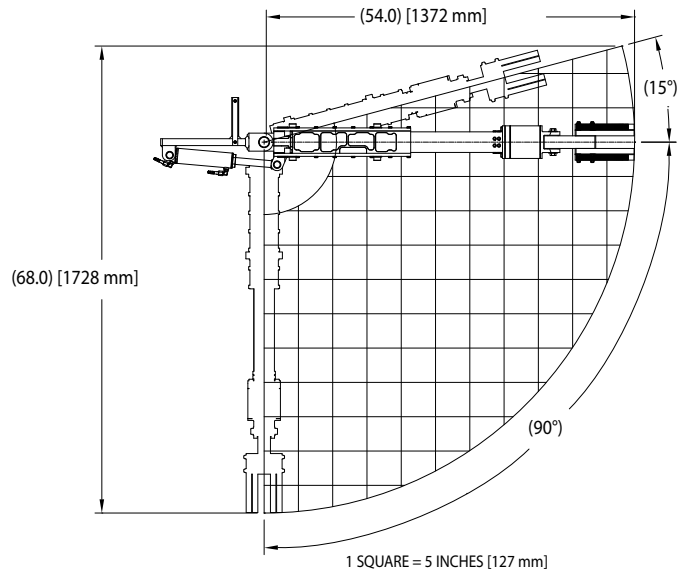
minimizes spare part requirements. Many parts are interchangeable throughout the entire Schilling manipulator line: TITAN 4, ATLAS, RIGMASTER, CONAN, and ORION.

### OPTIONS AND ACCESSORIES

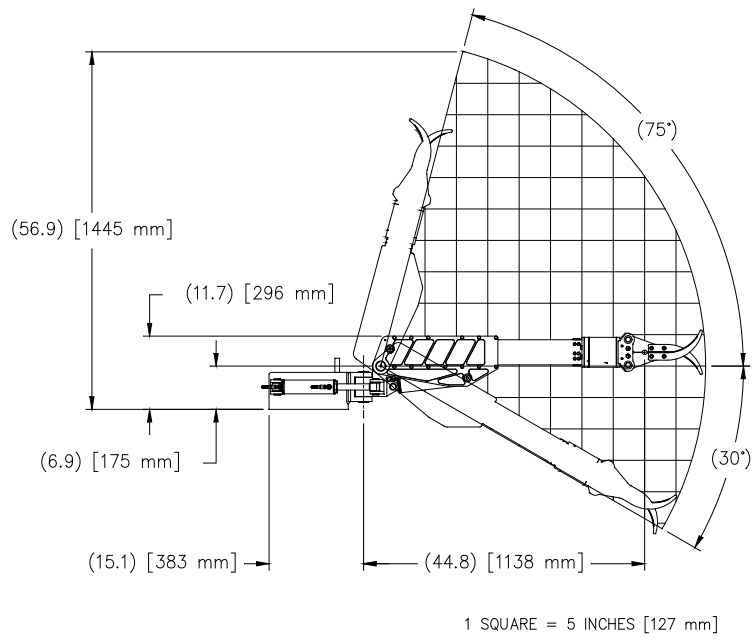
- Rate Hand Controller
- Relief Valve Kit
- Spares Kit
- Technician's Tool Kit



STOW DIMENSIONS



**RANGE OF MOTION, TOP VIEW**



**RANGE OF MOTION, SIDE VIEW**



## MANIPULATOR COMPARISON

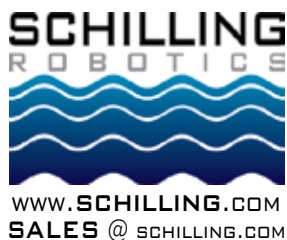
						
Model	<b>TITAN 4</b>	<b>ATLAS 7R</b>	<b>RIGMASTER</b>	<b>CONAN 7P</b>	<b>ORION 7P/7R**</b>	<b>ORION 4R</b>
Category	Heavy Work	Heavy Work	Heavy Work	Heavy Work	Medium Work	Medium Work
Power Source	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Rate/Position Control	Position	Rate	Rate	Position	Position or Rate	Rate
Number of Functions	7	7	5	7	7	4
Materials	Primarily Titanium	Anodized Aluminum & Stainless Steel	Anodized Aluminum, Stainless Steel & Titanium	Anodized Aluminum & Stainless Steel	Anodized Aluminum & Stainless Steel	Anodized Aluminum & Stainless Steel
Maximum Reach	1,922 mm/75.7 in.	1,664 mm/65.5 in.	1,067 mm/42.0 in. (retracted); 1,372 mm/54.0 in. (extended)	1,806 mm/71.1 in.	1,532 mm/60.3 in. (7P/R) 1,850 mm/72.8 in. (7PE/RE)	682 mm/26.9 in.
Input Device	Replica Master Arm	Rate Hand Controller	Rate Hand Controller	Replica Master Arm	Replica Master Arm or Rate Hand Controller	Rate Hand Controller
Depth Rating, Standard	4,000 msw/13,124 fsw	6,500 msw/21,000 fsw	6,500 msw/21,000 fsw	3,000 msw/9,800 fsw	6,500 msw/21,000 fsw	6,500 msw/21,000 fsw
Depth Rating, Optional	7,000 msw/23,000 fsw	N/A	N/A	N/A	N/A	N/A
Lift at Full Reach	122 kg/270 lb	250 kg/550 lb	270 kg/595 lb (retracted); 181 kg/400 lb (extended)	159 kg/350 lb	68 kg/150 lb	136 kg/300 lb
Weight in Air	100 kg/221 lb	73 kg/160 lb	64 kg/142 lb	107 kg/235 lb	54 kg/120 lb	30 kg/67 lb
Weight in Seawater	78 kg/174 lb	50 kg/109 lb	48 kg/105 lb	73 kg/161 lb	38 kg/83 lb	21 kg/46 lb

\*\*Specifications shown are for the standard-reach ORION 7P.

### CUSTOMER SUPPORT, TECHNICAL SUPPORT, AND TRAINING

- Worldwide Customer Support Network with Factory-Trained Technicians
- 24-Hour Telephone Access to Qualified Technical Staff
- On-Site and Offshore Installation/Mobilization Support
- Strategically Located Spares and Factory Service Facilities Worldwide
- Operation and Maintenance Training Courses Available at Our Factory, at Customer Facilities, or at Our Service Centers Worldwide

**SO DEEP, NO ONE COMES REMOTELY CLOSE**



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