

CONVERTTEAM
THE POWER CONVERSION COMPANY

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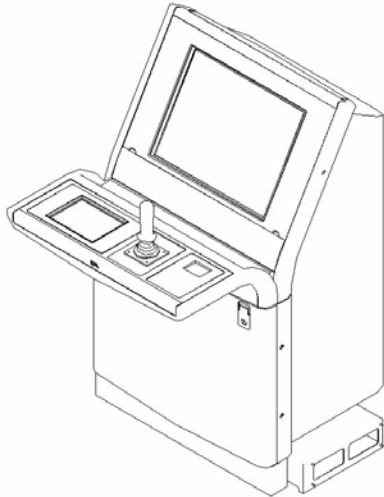
DP SCOPE OF SUPPLY

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2. DP SYSTEM

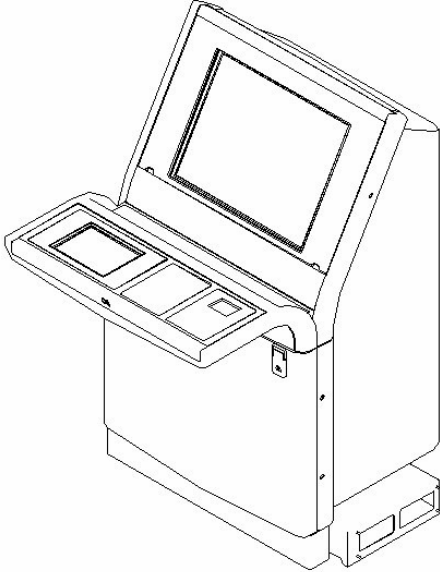
The Triplex C-Series Dynamic Positioning (DP) System supplied comes complete with the following equipment and functionality:

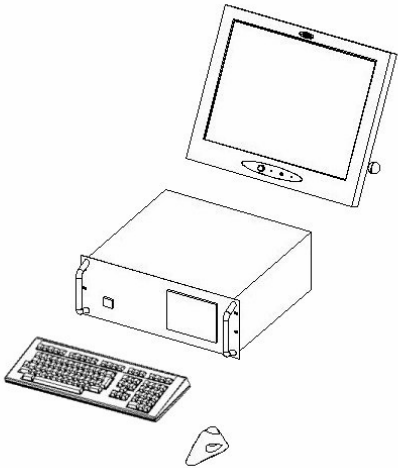


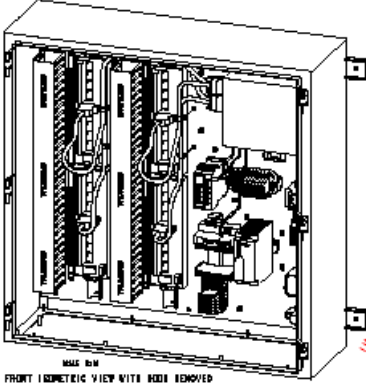
3 off DPS Workstation in a console

- Locations:
To be advised
- Marinated Operator Controls, HMI PC & Display in C-Series Console package
- Solid State Pointing device
- High quality 3-axis joystick
- Type Approved DP HMI PC
- Windows-XP Operating System
- 21.3" Flat Screen TFT High Resolution Monitor
- Industrial Resistive Touchscreen
- Dual Ethernet Interface with C-Series Network
- IP22 Rating
- 1200mmH x 700mmW x 873mmD (Max.)
- 135Kg
- Deck Mounted in Control Room environments
- Bottom Cable Entry (Plinth included)
- Power supply: autoranging 110Vac-230 Vac

Order code :

	<h3>1 off DP Display in a Console</h3>
	<ul style="list-style-type: none"> • Locations: <ul style="list-style-type: none"> 1 x Engine Control Room • Marinised Operator Display in C-Series Console package • Operator Alpha Numeric QWERTY Keypad including Programmable Keypad Function Keys • Solid State Pointing Device • 21.3" Flat Touch Screen High Resolution Monitor • Windows-XP Operating System • Dual Ethernet Interface with C-Series Network • IP23 • 1200mmH x 700mmW x 873mmD • 135Kg • Deck Mounted in Control Room environments • Bottom Cable Entry (Plinth included) • Single 1ph 230V AC Feed from UPS

	<h3>2 off DP Display</h3>
	<ul style="list-style-type: none"> • Locations: <ul style="list-style-type: none"> 1 x Workstation – Drillers Cabin (Not in Eex area) 1 x Workstation – Fiscal Office • Marinised Operator Controls & HMI package for Desktop or Console installation in Control Room environments • Operator Alpha Numeric QWERTY Keypad including Programmable Keypad Function Keys • Solid State Pointing Device • Windows-XP Operating System • 20.1" Flat Screen TFT High Resolution Monitor • Dual Ethernet Interface with C-Series Network • Single 1ph 230V AC Feed from VCS System UPS

	<h3>3 Off Controller Cabinet with I/O and 24 field links</h3>
	<ul style="list-style-type: none"> • Locations: To be Advised • Dynamic Position Controller comes complete with System Functional Software • Serial interfaces with positional, navigational, environmental equipment, etc. • IP44 Rating • 800mmH x 800mmW x 250mmD • 81Kg • Bulkhead Mounted • Bottom Cable Entry as standard via undrilled Gland Plate • Single 1ph 230V AC Feed from UPS <p>Order Code: CCnn ADP 002 124</p>

DP SYSTEM CONTROL MODES	
The following DP System Control Modes will be available to the DP Operator:	
<ul style="list-style-type: none"> Monitor Mode Joystick Manual Heading Joystick Auto Heading Dynamic Positioning Model Control (Dead Reckoning) Simulation (for training purposes) 	<ul style="list-style-type: none"> Riser Follow DP Minimum Power ROV Follow Auto Track Mixed Axis Mode

DP SYSTEM FEATURES

The following additional DP System Features will be available to the DP Operator:

Wind Compensation	Fast Learn Gains
Power Overload Protection	Relaxed DP
Gain Selection	Consequence Analysis
Centre of Rotation Selection	C-Maps Enabled
Data Logging	User defined save/load parameters
Waypoint Download – Serial	Day/Dusk/Night settings
Online Capability Analysis	Web diagnostics

DP SYSTEM INTERFACES

CONVERTEAM has catered for the following DP System interfaces to CONVERTEAM supplied DP equipment specified in the above sections and to DP related equipment not of CONVERTEAM supply

Position Measurement Equipment:

2	Sonardyne Acoustic System	RS232/RS422 Serial Link, CONVERTEAM standard format
4	Differential GPS	RS232/RS485 Serial Link, Standard NMEA 0183 version 2 \$GGA or \$GLL (\$GGA preferred)
1	Electric Riser Inclination Data system	RS232/RS485 Serial Link to DP Controller

Sensors:

3	Gyrocompass	RS232/RS485 Serial Link, Standard NMEA 0183 version 2 \$HDT (Heading - True)
3	Anemometer	RS232/RS485 Serial Link, Standard NMEA 0183 version 2 \$MWV (Wind Speed & Angle)
3	Motion Reference Sensor	RS232/RS422 Serial Link, TSS1 format

Main Propulsion/Thrusters/Steering		
2	Main propulsion	Hardwired to/from Integrated C-Series Field Station Units Note: The rudders will not be used for DP operations.
5	Tunnel Thruster	

Power:		
1	Power System	Hardwired to/from Integrated C-Series Field Station Units

1	Printer	RS485 Serial Link

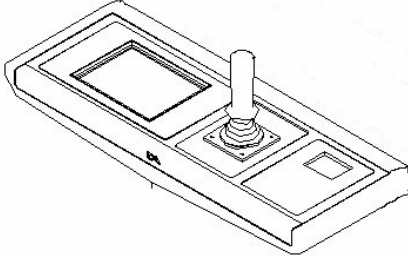
CONVERTEAM have assumed industry-standard serial link protocols that comply with those from CONVERTEAM's extensive library of DP serial interface protocols.

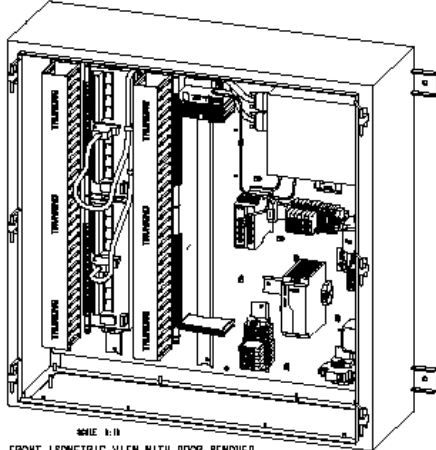
CONVERTEAM have included for isolated analogue outputs to third party devices.


CONVERTEAM has assumed that all analogue inputs will be isolated by the signal provider.

3. INDEPENDENT JOYSTICK SYSTEM

The Independent Joystick System supplied comes complete with the following equipment and functionality:

	<p>1 off Joystick Control Panel</p>
	<ul style="list-style-type: none"> • Locations: To be advised • Marineised Drop-in Joystick Control Panel • IP56 Rating • 5Kg (Approx) • 0.5m Flying Lead Cable for Data and Power • 24V dc Supply <p>Order code : JSnn XXX 002 XXX</p>

	<p>1 off IJS Controller Cabinet without I/O and 16 field links</p>
	<ul style="list-style-type: none"> • Locations: To be advised • CONVERTEAM Advanced Micro-Controller(AMC-DP) comes complete with System Functional Software • Up to 16 serial interfaces with positional, navigational, environmental equipment, etc. • Discrete serial links to Thruster/Steering & Switchboard Field Stations ensuring complete independence from the DP System. • IP44 Rating • 800mmH x 800mmW x 280 mmD • 70Kg • Bulkhead Mounted • Bottom Cable Entry as standard via undrilled Gland Plate • Single 1 ph 110V/ 230V AC 50 Hz feed from Isolated Supply (i.e isolation transformer) <p>Order code : CCnn ADP 002 016</p>

	1 off Joystick System Isolation Transformer
	<ul style="list-style-type: none"> Isolation Transformer

INDEPENDENT JOYSTICK SYSTEM CONTROL MODES	
The following Control Modes will be available to the DP Operator at the Independent Joystick Panels:	
Joystick Manual Heading	Joystick Auto Heading

INDEPENDENT JOYSTICK SYSTEM INTERFACES		
CONVERTEAM have catered for the following IJS System interfaces to CONVERTEAM supplied IJS equipment specified in the above sections and to DP related equipment not of CONVERTEAM supply		
Sensors:		
1	Gyrocompass	RS232/RS485 Serial Link, Standard NMEA 0183 version 2 \$HDT (Heading - True)
Main Propulsion/Thrusters/Steering		
2	Main propulsion	Via serial links to the thruster C-Series Field Station Units (integrated system)
5	Tunnel Thruster	

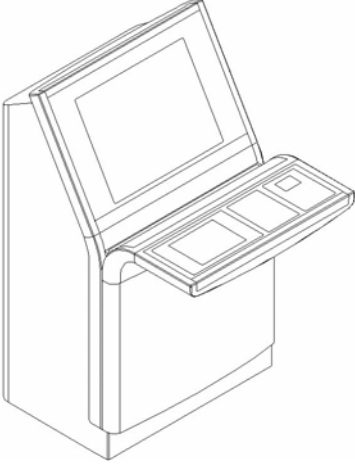
CONVERTEAM have assumed industry-standard serial link protocols that comply with those from CONVERTEAM's extensive library of DP serial interface protocols

CONVERTEAM have included for isolated analogue outputs to third party devices.

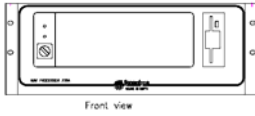
CONVERTEAM has assumed that any analogue inputs will be isolated by the signal provider.

4. POSITION MEASUREMENT SYSTEMS

The following Position and Velocity Measurement Systems are supplied:

	2 off PME Workstation in a console
	<ul style="list-style-type: none">• Location: To Be Advised• 1 set Acoustic Operator Controls• Solid State Pointing device• 21.3" Flat Screen TFT High Resolution Monitor• IP22 Rating• 1200mmH x 873mmW x 700mmD (Max.)• 135Kg• Deck Mounted in Control Room environments• Bottom Cable Entry (Plinth included)• Power supply: autoranging 110Vac-230 Vac <p>Order code :WSnn PME 001 XXX</p>

Navigation Processor



Transceiver Type 8021




1 OFF DUAL INDEPENDENT LUSBL SONARDYNE High Precision Acoustic Positioning System


The system consists of:-


- 2 off DP PME consoles, listed under 'equipment', to match the DP DP control console, housing 2 off Navigation Processor, inclusive of:-
 - 2 off Navigation processor
 - 2 off Processor Installation Kit, including all interface cables,
 - 2 off Distribution Unit + VRU and Gyro cables
 - 2 off Monitor to keypad cable
 - 2 off Monitor video cable
 - 2 off Twin keyboard/keypad adaptor
 - 2 off Keyboard cable 4 m
 - 2 off Manuals
 - 2 off Operating software for USBL/DEF Reference and LBL
 - 6 x Manual version 6 software
 - CASIUS calibration software
- 4 off Standard USBL head 8021
- 4 off Transceiver AGP Cable 50 m
- 4 off Transceiver installation kit

Note: Seabed transponders and riser angle transponders are not included in this offer.

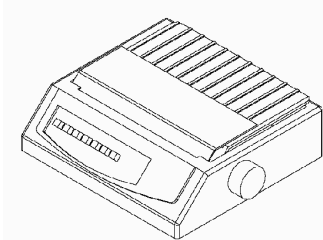
5. ENVIRONMENT SENSORS

	<p>3 Off Motion Reference Sensor TSS DMS- 10</p>
	<ul style="list-style-type: none"> • Location: To be advised • 99mm x 172 mm • 3.55 kg with 5 m length sensor cable • Dynamic accuracy: 0.1 <p>Order Code: 500283 (DMS-10)</p>

	<p>3 Off Anemometer</p>
	<ul style="list-style-type: none"> • Locations: Top of the mast • Gill Instruments Wind Observer II • 405 mmH x 210 mmW • 1.5 kg • IP66 <p>Order Code: 1390-PK-006</p>

	<p>3 Off Wind Display Unit</p>
	<ul style="list-style-type: none"> • Locations: To be advised • Young Marine Wind Tracker Model 06206 • IP51

6. DP SYSTEM PERIPHERALS




1 off DP System Alarm & Event Printer

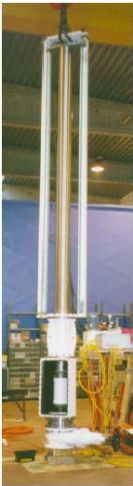
- Locations:
To be advised
- 80 column dot matrix printer with serial interface with DP System PC
- Prints hard copy of each system alarm and event as it occurs and their subsequent clearing
- Desktop Mounted
- 398mmH x 116mmW x 345mmD
- 8.5Kg
- Rear Cable Entry
- Single 1ph 230V AC Feed from UPS

THE CONVERTEAM SOLUTION
C-SERIES POSITIONING SYSTEMS
OPTIONAL SYSTEMS & SERVICES

6.1 OPTION 1. BOP COMMAND UNIT

	<p>1 Off Emergency Acoustic BOP Control System</p> <p>Permanent Command System (Operating via a USBL Transceiver):-</p> <ul style="list-style-type: none"> • 1 off Rack Command Unit. • Manuals <p>Note : Excluding software</p>
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6.2 OPTION 2. DEPLOYMENT MACHINES

	<p>4 OFF DEPLOYMENT MACHINES FOR ACOUSTIC SYSTEM</p> <p>The system consists of:-</p> <ul style="list-style-type: none"> • 4 off Hydraulic deployment machine; standard length, including:- <ul style="list-style-type: none"> • Hydraulic Powered Lifting and Lowering unit guide rods • Transceiver Pole 9.25" diameter • Remote control panel • Main electrical power cabinet • Bridge control panel • Hydraulic power pack • Guide and sealing section • Service section including hatch • 14" mm gate valve (DNV cert) (manual drive) • 350 mm weldable flange (for the gate valve) • Manuals
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Key features:

- High strength carbon steel pole for stiffness and strength, 241mm diameter.
- Inconel™ coating for durability and corrosion resistance.
- High integrity bearing and sealing section
- Configurable design, can be Zone 1 Ex rated

- Reliable hydraulic actuation with safety interlocks.
- Easy access to the transceivers for maintenance and cleaning.
- Easy and convenient actuation of machine from Bridge and other locations. Gate valve can also be actuated (optionally) from remote.
- DNV certified.