



World leaders in diving equipment technology

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Divex Twisted Umbilicals are the choice of diving professionals including construction, police, rescue and saturation divers worldwide.

Umbilicals used for diving applications operate in physically demanding conditions and provide the vital link between the diver and the surface. Diver's umbilicals are the lifeline from diver to the bell or surface while they work subsea. Umbilicals supply breathing gases, communications, power, video data, and possible heliox breathing gas to be reclaimed in the case of saturation diving.

'Surface Demand Umbilicals', operate directly from the surface to the diver. 'Wet Bell Excursion Umbilicals' and 'Saturation Bell Excursion Umbilicals' operate via the main bells and their service umbilicals to the surface. All of these umbilical types are capable of withstanding tensile loading sufficient to lift the diver in an emergency.

Advantage by Design: twisted umbilicals offer significant advantages including great flexibility and strength while resisting kinking, and abrasion due to the inherently strong 'rope like' structure. Such is the breaking resistance that no additional safety line is required.

Unlike rubber or PVC compounds, used previously for diving umbilicals, the hoses are made predominantly from polyurethane. Polyurethane is a particularly clean unfilled polymer containing no plasticisers or potentially harmful additives. This ensures breathing gas quality is maintained under all conditions from -40°C to +60°C. In addition,

Divex Diver Umbilicals

polyurethane does not deteriorate significantly with age and remains flexible and abrasion resistant, therefore easily outlasting rubber and PVC hoses.

Divex manufacture and stock the most popular style of air dive umbilical detailed overleaf. Variations on umbilical fittings, lengths and additional cables or hoses are of course available but for rapid service the Divex Air Diver Umbilical is available ex-stock in 50m, 75m and 100m lengths normally ready to go the same day.

Exceptional Safety, Quality & Diver

Acceptance: The Divex Air Diver Umbilical is professionally certified and completed in every way:

- 1 Pressure tested and certified to maximum working pressure by qualified competent Divex technicians. The hoses are then 'blown through' with breathing quality air to dry them. It is recommended that diving umbilicals are pressure tested annually or following any period of extensive usage or loading.
- 2 Electrical Continuity - tested in all modes.
- 3 Whipping of the attachment 'D' rings is carried out to ensure diver security, and a 3³/₄"/100mm Karabiner with screw lock mechanism is fitted to the diver end.

Universal Communications: The Divex 4 wire communications system enables simple utilisation of any diver surface radio and any mask/helmet communications system. A laminated instruction card is provided and attached to each umbilical as well as being explained overleaf.

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Wiring Options: Divex Air Diving Umbilicals are fitted as standard with 4 contact female Divex RMG type connectors, wired thus:



The surface end of the umbilical is terminated with four separate wires fitted with single pin stacking 'banana' plugs to suit Divex air diving radios (and most others). This permits wiring configurations for the following systems to be achieved.

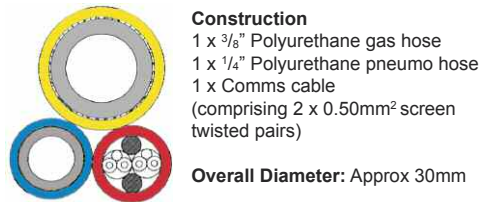
Simplex and Duplex Comms Explained:
Simplex - the most common system used and suitable for Divex/AGA masks, AH3 to 5 helmets and DSI masks and helmets. This system ensures that communications from the diver to the dive supervisor is always 'on', unless the supervisor has activated the spring-loaded push-to-talk switch to speak to the diver.

Duplex - there is much confusion and misunderstanding from within the industry as to what 'Duplex' communications is. Simply put it enables all parties connected to the system to talk and listen at the same time. The advantage is that all parties can hear and speak; the disadvantage is that ambient surface noises, breathing noises and possible distressed diver noises are heard by all. There is no opportunity for diver to surface bias as all parties communicate at once.

In practise with current surface demand diving techniques, the standard Divex 3 component umbilical comprises comms cable, gas hose and pneumo hose as detailed in the section drawing on the left.

All standardised umbilicals are manufactured and stocked with BSP fittings at the surface end and 9/16 UNF fitting at the diver's end, with comms wired for both simplex or duplex communications options to suit your application. However should your requirements demand JIC fittings to suit your dive panels then these can be manufactured to suit. Divex umbilicals can also incorporate light and TV/video cables, hot water and gas reclaim hoses into the standard 3 component umbilical. Please discuss your requirements at time of order.

Cross Section of 3 Component Universal Umbilical



Standard Divex Umbilical at the Diver's End



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UMBILICAL COMPONENT SPECIFICATIONS						
HOSE TYPE	HOSE LAYERS MATERIAL SPECIFICATION	INTERNAL DIAMETER	OVERALL DIAMETER	WORKING PRESSURE	BURST PRESSURE	WEIGHT IN SEAWATER
Gas (yellow)	Liner: Elastomeric thermoplastic Middle: Polyester fibre braid Sheath: Polyurethane	3/8" (9.5mm)	0.69" (17.5mm)	500 psi (35 Bar)	2000 psi (140 Bar)	0.035lb/ft (52gm/m)
Pneumo (blue)	Liner: Polyurethane, Middle: Adhesive polyester fibre braid Sheath: Polyester fibre braid	1/4" (6.5mm)	0.45" (11.5mm)	500 psi (35 Bar)	2000 psi (140 Bar)	0.011lb/ft (16gm/m)
Hot Water (black)	Liner: Extruded thermoplastic rubber tube (TPR) Max Working Temp: 99°C Middle: Polyester fibre braid Sheath: Polyurethane	1/2" (12.5mm)	0.83" (21mm)	350 psi (25 Bar)	1400 psi (100 Bar)	0.071lb/ft (105gm/m)
Reclaim (black)	Liner: Seamless, thick-walled PU tube Middle: Encapsulated polyester braid Sheath: External over braid	5/8" (16mm)	1.6" (27mm)	1000 psi (69 Bar)	4000 psi (276 Bar)	0.064lb/ft (95gm/m)
Comms (red)	Centre: 2 x 0.50mm ² screened twisted pairs Binder: Polyester tape Braid: Polyester fibre. Sheath: Polyurethane - red	N/A	0.43" (10.75mm)	CABLE SPEC 2 x 0.5mm ²	N/A	0.017 lb/ft (21gm/m)
TV (orange)	5 electrical cables for TV/Video operation Filler: Silicone compound Sheath: Polyurethane	N/A	0.43" (11mm)	N/A	N/A	0.039 lb/ft (70gm/m)



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Optional Umbilical Build Configurations

Surface Demand/Sat/Stand-By
Excursion/Umbilicals can include services for diver's gas supply, hot water, depth reading, telemetry, communications, hat light power, video transmission.

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Surface Demand Umbilical or Wet Bell (Excursion Umbilical)

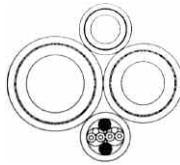


Construction

- 1 x $\frac{3}{8}$ " Polyurethane gas hose
- 1 x $\frac{1}{4}$ " Polyurethane pneumo hose
- 1 x Comms cable
- 1 x mini-tv cable:
 - 1 x 1.34mm² screen twisted pair
 - 1 x 0.50mm² screen twisted pair
 - 1 x 0.22mm² twisted pair
 - 1 x 1.34mm² conductor
- 1 x 75 coaxial cable

Overall Diameter: Approx 41mm

Surface Demand Umbilical with Hot Water



Construction

- 1 x $\frac{3}{8}$ " Polyurethane gas hose
- 1 x $\frac{1}{2}$ " Polyurethane hot water hose
- 1 x $\frac{1}{4}$ " Pneumo hose
- 1 x Comms cable

Overall Diameter: Approx 30mm

Please Contact our Sales Department to discuss component configurations to suit specific diving requirements.

Divex Universal Umbilical - 50 Meters

Order Code DD3300504UFBA

Divex Universal Umbilical -75 Meters

Order Code DD3300754UFBA

Divex Universal Umbilical - 100 Meters

Order Code DD3301004UFBA