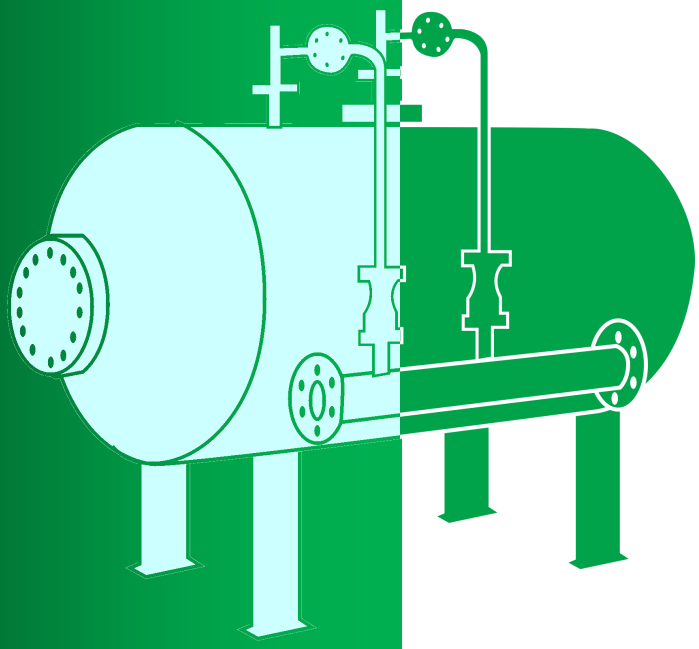
BRISTOL



FOAM SYSTEM

FOAM PROPORTIONING UNIT

CONTENTS

BRISTOL FOAM PROPORTIONING UNIT

BLADDER TANK WITH RATIO FLOW CONTROLLER

FEATURES

- UL LISTED with AFFF-3% & AR-AFFF3% Foam Concentrates
- Designed & Constructed as per ASME Sec.VIII Div.1 (Optional - ASME U Stamped)
- Largest Range of Capacities (200 Liters to 15000 Liters) in Vertical & Horizontal Mounting
- Largest Range of Ratio Controllers 50NB/80NB/100NB/150NB/200NB
- Widest Flow Range (75-20,000 LPM)
- Lowest Proportioning Losses
- Nylon reinforced nitrile foam bladder is UL Listed with AFFF& AR-AFFF Foam
- Concentrate & compatible with all types of foam concentrates
- High reliability and design simplicity minimizes chances of system failure
- Manual I automatic operation
- Horizontal I Vertical Mounting
- Low installation cost
- Can be adapted into existing foam system

Technical Data

Bladder Tank		
Orientation	Horizontal	Vertical
Capacity	400L - 15,000L	200L - 15,000L
Design Code	ASME Sec.VIII Div.I Latest Edition	
Max. Working Pressure	12.06 Bar (175 psi)	
Hydrostatic Test Pressure	18.09 Bar (263 psi)	
Internal Finishing	Coal Tar Epoxy	
External Finishing	Painted Epoxy Flame Red (RAL 3000)	

FOAM SYSTEM

APPLICATION

BRISTOL Foam Proportioning Unit - Bladder Type is a very versatile and reliable foam proportioning unit, which provides accurate and automatic foam proportioning with very low proportioning losses.

Unit can be supplied with a single or multiple proportioners for covering a wide flow range.

Foam Proportioning Unit - Bladder Type is most ideal for foam systems employed for protection of hazardous areas, such as:

- Flammable liquid storage tanks in refineries and petrochemical units
- Chemical process plants
- Air-craft hangars
- Loading and Unloading gantries
- Oil Jetties
- Off-Shore Platforms
- Warehouses

Foam application through spray nozzle and foam sprinkler.

DESCRIPTION

Foam Proportioning Unit - Bladder Type is a self contained foam proportioning unit used for injecting the foam concentrate into fire-water stream over a wide range of flow and pressure.

Units are available from 200 Liters to 15,000 Liters in Vertical as well as Horizontal Mounting. General arrangement of vertical mounting shall be as per Fig.02 and horizontal mounting shall be as per Fig.01.

The dimensions of foam vessel may be subject to change as per changes in design. Unit consists of a foam vessel, foam bladder, foam proportioner, inter-connecting piping, valves and concentrate level gauge.

Note - Foam Bladder is UL Listed for use with AFFF & AR-AFFF Foam Concentrates.

OPERATION

During operation, water is charged between the foam vessel and the foam bladder, thereby causing the pressurization of foam concentrate stored inside the foam bladder to a pressure, as that of fire-water supply.

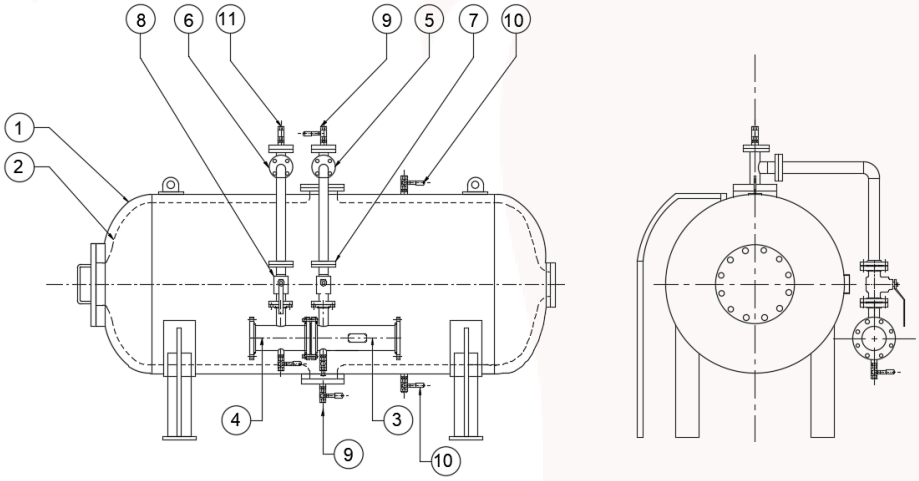
The foam concentrate is injected in the fire- water stream due to pressure drop at the foam proportioner. Foam proportioner provides accurate and automatic proportioning of foam concentrate within its flow range with very low proportioning losses.

SPECIFICATION

Foam vessel is designed and fabricated to ASME Sec.VIII Div.I for a maximum working pressure of 12.06 Bar and hydro tested to a pressure of 18.09 Bar. All the welded joints and sharp corners are ground smooth. Internal surface is coated with coal tar epoxy and external surface with fire-red epoxy paint. Lifting lugs are welded to the vessel. Vertical vessel is provided with leg supports and horizontal vessel with saddle supports. Anchoring holes are drilled in the base plate of supports. Anchor bolts are also supplied with the unit.

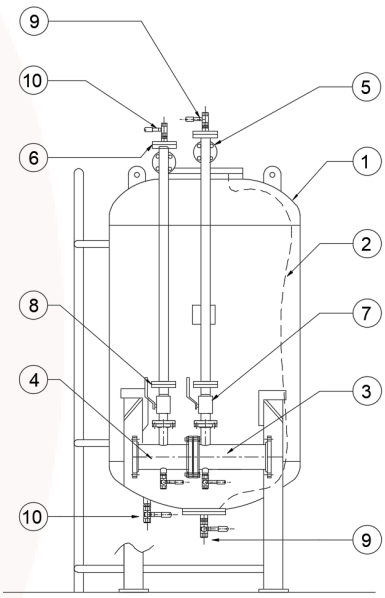
COMPONENTS

Part No.	Part Name	Material
1	Foam Vessel	Carbon Steel
2	Foam Bladder	Nylon Reinforced Nitrile Rubber (BUNA-N)
3	Foam Proportioner	Carbon Steel with Stainless Steel
4	Spool Piece	Carbon Steel
5	Foam Piping	Stainless Steel
6	Water Piping	Carbon Steel
7	Foam Supply Valve	Stainless Steel
8	Water Charging Valve	Stainless Steel
9	Bladder Vent / Bladder Drain	Stainless Steel
10	Vessel Vent / Vessel Drain	Stainless Steel
11	Thermal Expansion Relief Valve	Copper Alloy



Horizontal Bladder Tank

Fig. 01

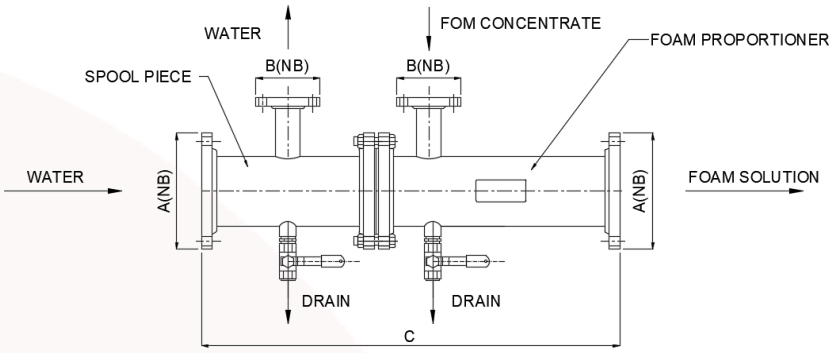


Vertical Bladder Tank

Fig. 02

RATIO FLOW CONTROLLER

MATERIAL OF CONSTRUCTION		
SR. NO	**DESCRIPTION**	**MATERIAL**
1	Body	Carbon Steel
2	Water Nozzle	Stainless Steel
3	Foam Nozzle	Stainless Steel
4	Drain Valve	Stainless Steel



Technical Data

MODEL	BBT-RFC
APPROVAL	UL Listed with AFFF 3% % AR-AFFF 3x3%
MAX. WORKING PRESSURE	12.06 bar (175 psi)
FOAM PROPOTIONING RATIO	3% with AFFF & AR-FFF Foam Concentrate
HYDRAULIC TEST PRESSURE	18.09 bar (263 psi)
FLANGE DRILLING	As per ANSI B16.5, 150#, RF
INTERNAL FINISH	Coal Tar Epoxy
EXTERNAL FINISH	Epoxy Fire Ref (RAL 3000)

PERFORMANCE & DIMENSION DATA					
MODEL	**Nominal Diameter (A)**	**Foam Concentrate Inlet Diameter (B)**	**Length (C)**	**Nominal Flow Range (L/ min)**	**Proportioning Ratio**
BBT-RFC2	DN50	DN25	1000mm	75-1000	3%
BBT-RFC3	DN80	DN40	1000mm	200-3200	3%
BBT-RFC4	DN100	DN40	1000mm	400-6200	3%
BBT-RFC6	DN150	DN50	1000mm	1000-11500	3%
BBT-RfC8	DN200	DN65	1000mm	3000-20000	3%

Water/Foam Monitor

Fixed-flow/Variable Flow

BRISTOL UL Listed water cum Foam Monitors offer superior durability in Marine, Chemical, Oil and Gas Sector, Ports, Jetties, Onshore and Offshore Platforms. Made out of Stainless Steel, these monitors are fit for optimum performance where corrosion is quite high.

Non-Aspirating Aqua Foam Nozzle capable of Jet and spray movement are very much compatible for Jet-Ratio controller unit without any modification.

Horizontal and vertical movement of the monitor is done by Geared Swivel Joint with the help of hand-wheel.

Jet Ratio Controller Pump is a venturi - type device to feed large volumes of foam from a safe location to a self - inducting nozzle. JRCPs are supplied in conjunction with matched aqua foam nozzles. JRCP body is all SS 304 / 316 construction.

TECHNICAL SPECIFICATION

Fixed Flow and Variable Flow Monitors		
1	Material	Stainless Steel
2	Nozzle	Aqua Foam Non - Aspirating Jet Spray Type
3	Monitor Movement	Horizontal and Vertical movement by worm and worm
4	Hydro Static Test	25 Bar
5	Operating Pressure	Min. 7 Bar | Max. 12.6 Bar
6	Monitor Rotation	360°
7	Monitor Elevation	+90° to –45°
8	Foam Induction	3 %

Dimensions

MODEL	Inlet Flange	Barrel	Flow Rate	Induction Mechanism	Horizontal Throw @ 30° Still Air	
					Water	Foam-Water
FFM-SI-500-4	4"	3"	500gpm	Self-Inducting	50m	45m
FFM-SI-750-4-5045	4"	3"	750gpm	Self-Inducting	60m	55m
FFM-SI-750-4-6055 *	4"	3"	750gpm	Self-Inducting	60m	55m
FFM-SI-1000-4	4"	4"	1000gpm	Self-Inducting	70m	65m
FFM-JRCP-1000-4	4"	4"	1000gpm	JRCP	70m	65m
VFM-SI-500/750-4	4"	4"	500/750gpm	Self-Inducting	50/60m	45/55m
VFM-JRCP-500/750-4	4"	4"	500/750gpm	JRCP	50/60m	45/55m
VFM-SI-500/750/1000-4	4"	4"	500/750/1000gpm	Self-Inducting	50/60/70m	45/55/65m
VFM-JRCP-500/750/1000-4	4"	4"	500/750/1000gpm	JRCP	50/60/70m	45/55/65m
VFM-SI-1000/1500/2000-6	6"	6"	1000/1500/2000gpm	Self-Inducting	70/75/80m	65/70/75m
VFM-JRCP-1000/1500/2000-6	6"	6"	1000/1500/2000gpm	JRCP	70/75/80m	65/70/75m

**Lever Type Actuator*

DELUGE VALVE

BRISTOL Valve is Hydraulically actuated, pilot operated diaphragm control valve.

The XT-4080 Series Deluge Valve is held closed by system water pressure trapped in the top cover chamber. When the releasing system operates, pressure is released from the top cover chamber and the diaphragm assembly moves upward allowing the water to flow into the system.

ADVANTAGES

- Steel body for longer life.
- All sizes are with stainless steel pilots for very quick opening.
- Valve size up to 8" will open within 2 seconds.
- Unique Quad Ring seal from Parker/3M-USA for drip tight shut off.
- Diaphragm of even thickness, flexible and strong rated up to 375 psig pressure.
- Deluge Valve is completely Pre-piped with Wet Trim/Pneumatic Trim from factory - saving high labour cost to do Trim Fitting at site.

SOLENOID ACTUATED

Model No.: XT-4080S

- UL Listed - Model XT-4080S Size 4" 6" & 8"
- Fast acting Solenoid Control
- Drip Tight-Shutoff
- Simple Design-Pressure Reliability
- Easy installation and maintenance without removing valve from the line
- All Deluge Valve trims are pre-piped at factory

BRISTOL DELUGE VALVE XT-4080S (Solenoid Controlled) is an ON/OFF control valve which either opens or closes upon receiving an Electrical Signal to the Solenoid Pilot Control. This valve consists of XT-4080 UL-listed Main Valve, a 3/2 way Solenoid Valve, an Auxiliary Pilot and a Manual Release Station.

The Pilot Control System applies line water pressure to or relieves water pressure from the diaphragm chamber of the main valve to close or open the Deluge Valve. It is supplied either Normally Closed (Energize Solenoid to open) or Normally Open (De-energize Solenoid Valve to open)

PNEUMATIC/HYDRAULIC

Model No: XT-4080P

- UL Listed - XT-4080P Size 4" 6" & 8
- Quick response to Air supply to Pilot
- No Gland Packing
- Dry Pilot Trim when air is used for sprinkler system

BRISTOL DELUGE VALVE XT-4080P is used for Dry Pilot Trim-Air Operated Deluge System. The valve can be used with direct air supply to the pilot in which case, the Deluge Valve will open in case of Air Pressure Loss. The valve can also be used with Solenoid Valve, where air is supplied to Pilot Valve through 3/2 way Solenoid Valve which keeps Deluge Valve in closed condition.

In case of FIRE or TEST, the 3/2 way Solenoid Valve is energized, which removes air from the Pilot Valve. This open the Pilot Valve and releases water from the cover chamber of main valve which opens Main Valve - Deluge Valve.

Specifications & Materials

BRISTOL DELUGE VALVE XT-4080S /XT-4080P	
Connection Type	4ll / 6ll / 8ll Flanged to ANSI B16.5 Class 150
Pressure Rating	150 Class, Max 285psig (20barg)
Temperature Range	70°C / 160°F Max. (Water)
Main Valve Body & Cover	Cast Steel ASTM A216 Gr. WCB Naval Bronze: ASTM B61 Nickel Al-Bronze: ASTM B148/BS1400 Gr. AB2 Stainless Steel: ASTM A351 Gr. CF8/CF8M
Valve Seat	Stainless Steel Gr. 316
All other internal parts	Stainless Steel Gr. 304
Stem	Stainless Steel Gr. 316
Pilot	Stainless Steel
Tubing & Fitting	Stainless Steel
Elastomers	NBR / Buna-N Nylon Reinforced

BRISTOL DELUGE VALVE XT-4080S /XT-4080P			
Valve DN (inches)	4"	6"	8"
Valve DN (mm)	100	150	200
Valve Cover Chamber Capacity (L)	0.616	1.96	4.73
Flow Rate (gpm @ 1psi Δ P)	220	460	840
Max. Continuous Flow Rate (gpm, Water)	800	1800	3100
Max. Intermittent Flow Rate (gpm, Water)	1000	2300	3900
Approx. Weight (kgs)	55	115	182

DELUGE VALVE

Solenoid Control Specifications	
Type	3/2 way - Normally Open Energize to open Deluge Valve
Body	Brass ASTM B283 Stainless Steel
Enclosure	- Weather proof to NEMA type 1,2,3,4,5. NEMA type - 6,7,9 - watertight IP 65. Ex-proof PESO/CMRI certified for Gr.IIA/IIB at extra cost. UL approved Ex-proof/ATEX at extra Cost
Voltage	110V/220V-AC-60Hz/50Hz 24V/48V DC
Coil	Class F
Current - AC Coil	6 Watts
Current - DC Coil	10.6 Watts
Inrush Amp.	30 VAC
Holding Amp.	16 VAC
Manual Operator	Available on request at extra cost

MOBILE FOAM UNIT

BRISTOL MFU-01

FEATURES

- Mobile foam cart with stainless steel tank
- Durable for use in rugged and corrosive environments like chemical plants, on-shore platforms, jetty.
- First aid and rapid deployment in high risk areas
- Easy access in narrow corridors and tight passages where fixed piping or fire vehicle are inaccessible.
- Provision for storage of 2nos of 2.5" x 15m fire hose

COMPONENTS

- FOAM TANK
  - Made of corrosion-resistant stainless steel
- INLINE INDUCTOR
  - 3% to 6% induction
  - Made of aluminum alloy
  - 225 LPM water capacity at 7kg/cm2
- FOAM MAKING BRANCH
  - Made of aluminum alloy
  - 225 LPM Foam-water solution capacity at 7kg/cm2.
- FIRE HOSE (2nos)
  - Three layered synthetic jacketed, with elastomeric outer covering.
  - Highly resistant to liquids, oils, chemical, acid, alkalis, solvent, abrasion and heat.
  - Fire Hose Dia. 2.5" X 15mtr
  - Conforming to BS: 6391, Type-3

Capacity

Model	Capacity
MFU-01/100	100L
MFU-01/150	150L
MFU-01/200	200L

MOBILE FOAM UNIT–MONITOR TYPE

BRISTOL MFU-01M

FEATURES

- Mobile foam cart with stainless steel tank
- Durable for use in rugged and corrosive environments like chemical plants, on-shore platforms, jetty.
- First aid and rapid deployment in high risk areas
- Easy access in narrow corridors and tight passages where fixed piping or fire vehi-cle are inaccessible.
- Proportions foam even at low water inlet pressures.

COMPONENTS

FOAM TANK

- Made of corrosion-resistant stainless steel

FOAM MONITOR

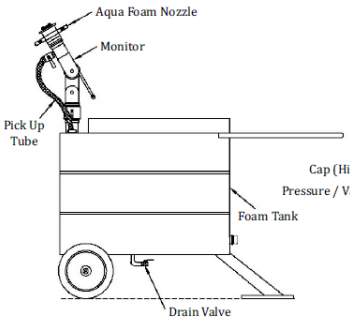
- 500GPM at 7Bar
- With Self-Inducting Nozzle at 3%
- Made of stainless steel
- Gear Operated
- Bristol (FFM-SI-500-4 , UL Listed)

FIRE HOSE (Water Supply)

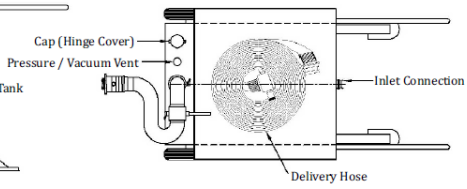
- Three layered synthetic jacketed, with elastomeric outer covering.
- -Highly resistant to liquids, oils, chemical, acid, alkalis, solvent, abrasion and heat.
- Fire Hose Dia. 2.5" X 15mtr
- Conforming to BS: 6391, Type-3

Capacity

Model	Capacity
MFU-01M/100	100L
MFU-01M/150	150L
MFU-01M/200	200L



Front View



Top View

FOAM MAKING BRANCHPIPE

BRISTOL FMB4

FEATURES

- Designed to perform well with all types of foam
- Designed for low expansion foam applications with expansion ratio of 1:2 to 1:12
- Available with control valve option
- Available with Built-in Inductor at 3% induction rate and pick-up tube option

Specifications	
Inlet	DN40 / DN65
Type	M. Instantaneous BS336
Material	Aluminum / Stainless Steel

Model Variants	Flow @ 7bar
FMB4-1	225Lpm
FMB4-2	450Lpm
FMB4-3	900Lpm

Model Variants	Flow @ 7bar
FMB4/V-1	225Lpm
FMB4/V-2	450Lpm
FMB4/V-3	900Lpm

With Control Valve

Model Variants	Flow @ 7bar
FMB4/P-1	225Lpm
FMB4/P-2	450Lpm
FMB4/P-3	900Lpm

With Built-In 3% Proportioner and Pick-Up Tube

FOAM MAKER

FEATURES

- Designed for the use in Fixed Roof Tank with low expansion Foam System
- Air-aspirating foam chamber consists of expansion chamber and foam maker with stainless steel mesh for aeration and prevention of entering of foreign objects
- Carbon steel or stainless steel construction
- Hot dip galvanized for corrosion resistance in case of carbon steel construction
- 5 models available to cover all the flow requirements
- Orifice plate designed as per the required flow at a desired pressure is standard supply along with Foam Maker
- Orifice plate can be changed in case of change in design parameters

Inlet	Outlet	Discharge Flow
50	80	75-225Lpm
65	100	226-450Lpm
80	150	451-900Lpm
100	200	901-1800Lpm
150	250	1801-2700Lpm

FOAM CHAMBER

FEATURES

- Designed for the use in Fixed Roof Tank with low expansion Foam System
- Air-aspirating foam chamber consists of expansion chamber and foam maker with stainless steel mesh for aeration and prevention of entering of foreign objects
- Carbon steel or stainless steel construction
- Hot dip galvanized for corrosion resistance in case of carbon steel construction
- 5 models available to cover all the flow requirements
- Orifice plate designed as per the required flow at a desired pressure is standard supply along with Foam Chamber
- Orifice plate can be changed in case of change in design parameters
- Inspection of Vapor Seal is simplified with the help of Handle on top of removable cover plate of Foam Chamber
- Foam Deflector for directing the expanded foam into the tank is optional accessory.

HIGH BACK PRESSURE FOAM GENERATOR

FEATURES

- Designed to generate expanded foam for the purpose of subsurface injection into a liquid hydrocarbon storage tank.
- High Back Pressure Foam Makers are mounted at the bottom of the Tank or outside the diked area surrounding the storage tank.
- Expanded foam is injected through a dedicated Foam line or into a Liquid Hydrocarbon line. Can discharge against a back pressure as high as 40% of the operating inlet pressure.
- High Back-Pressure Foam Maker is available with Self Induction Mechanism and another for the use with Premix Foam Solution
- Stainless Steel Screen Mesh for Aeration and prevention of entering of Foreign objects Aluminum Alloy Hard Anodized, Carbon Steel or Stainless Steel Construction
- Hot Dip Galvanised for Corrosion resistance in case of Carbon Steel Construction
- Custom Design based on required Flow Rate

Inlet	Outlet	Discharge Flow
50	80	75-225Lpm
65	100	226-450Lpm
80	150	451-900Lpm
100	200	901-1800Lpm
150	250	1801-2700Lpm

Over 100 Distributors Worldwide

UAE Offices

Abu Dhabi

Concorde Trading Company
Tel: +971 2 6668770 Fax: +971 2 6667863

Concorde Trading Showroom
Tel: +971 2 4433317 Fax: +971 2 4434746

Concorde Technical Company
Tel: +971 2 5575551 Fax: +971 2 5575550

Bristol Vehicles Manufacturing Division
Tel: +971 2 5575551 Fax: +971 2 5575550

Al Ain

Concorde Trading Company
Tel: +971 3 7642267 Fax: +971 3 7642268

Sharjah

Corodex Agencies
Tel: +971 6 5430800 Fax: +971 6 5430801

Dubai

Corodex Trading Company
Tel: +971 4 3472900 Fax: +971 4 3472796

Corodex Agencies (Fire Protection & Automation)
Tel: +971 4 3472530 Fax: +971 4 3472501

Bristol Fire Engineering
Tel: +971 4 3472426 Fax: +971 4 3472363

Corodex Agencies (Safety & Rescue)
Tel: +971 4 2668966 Fax: +971 4 2624617

International Offices

Oman

Integrated Engineering Solutions (IES)
Tel: +968 24700349 Fax: +968 24700631

KSA

Concorde Advance Technical Solutions
Tel: +966 12 6984993 Fax: +966 12 6984991

Intertek
NFPA
FM APPROVED
UL LISTED
CE

BRISTOL
FIRE ENGINEERING
P.o.Box 74582 Dubai, UAE
Tel: +971 4 3472426 Fax: +971 4 3472363
Email: sales@bristol-fire.com, www.bristol-fire.com

Member of
Since 1974
Concorde - Corodex Group