

# FLAMMEX





## Gas Fire Suppression System

### Description

- The MARSHALL 1230 offers a long-term, sustainable technology. It is a next-generation Halon alternative. It is a high quality, compliant fire extinguishing system using a clean agent.
- This Clean Agent is stored as fluid and discharged as gas. The system extinguishes fire by removing the heat from the fire. It utilizes the halocarbon gas Fluorinated Ketone (FK-5-1-12).
- The MARSHALL 1230 Clean Agent is traditionally, fire extinguishing systems for the offshore and maritime industry have contained components harmful to the environment and personnel, such as Halon and CO<sub>2</sub>.

### Approvals & Standards

#### FK-5-1-12

- Underwriters Laboratories Inc. (UL)
- US EPASNAP Rpt.
- NFPA 2001 Clean Agent Fire Extinguishing System

### Application

- Control and Communication
- Telecommunication sites and IT technologies
- Communication Facilities
- Server Rooms
- Buildings, Banks, Offices, Hotels, Shopping
- Centers Cultural and Artistic Landmarks
- Archives and Libraries
- Power generation and transmission facilities
- Manufacturing Sites
- Industry Facilities
- Oil and Gas Industries
- Marine Applications
- Air and Military Equipment Facilities

### Features

- Considerably lower price of the system
- Easier and lower cost maintenance
- Highest safety margin for human-occupied spaces among clean agents
- World-wide recognized and approved extinguishing agent
- long-term technology
- Ozone Depleting Potential (ODP) of zero
- low toxic and relatively safe to handle
- odorless, non-conductive & leaves no residue
- Extinguishes faster than either water mist or inert gas
- To protect critical business assets, such as sensitive equipment

### MARSHALL1230 System

- Underwriters Laboratories Inc.
- (UL) FM Approvals (FM)

### Components of MARSHALL1230 Fire Suppression System

#### Mechanical components

- Agent Cylinder
- FK-5-1-12 Agent
- Discharge Valve Head
- Pressure Gauge
- Electrical Actuator
- Manual Actuator
- Discharge Hose
- Check Valve
- Discharge Nozzle
- Cylinder Mounting Equipment
- Signage
- Pipes & Fittings

#### Electrical Components

- Fire Extinguishing
- Control Panel
- Detector
- Manual Release Station
- Abort Switch
- Sounder
- Strobe Sounder



## FK-5-1-12 Physical Properties

Properties	Value
Chemical Name	Fluorinated Ketone (FK-5-1-
Chemical Formula	12) CF <sub>3</sub> CF <sub>2</sub> C(O)CF(CF <sub>3</sub> ) <sub>2</sub>
Molecular Weight	316.04 g/mol
Boiling Point @ 1.013 bar	49.2 °C
(absolute) Freezing Point	-108
Critical Temperature	168.7 °C
Critical Pressure	18.65 Bar
Critical Volume	494.5 cc/mole
Critical Density	639.1 kg/m <sup>3</sup>
Specific heat, liquid @ 25 oC	1.103 kJ/kg °C
Specific heat, vapour @ constant pressure (1 atm) and 25oC	0.891 kJ/kg °C
Heat of Vaporization at boiling point	88 kJ/kg
Thermal conductivity of liquid @ 25oC	0.56/0.39 centistokes
Viscosity, liquid at 25oC	2.3
Relative dielectric strength at 1 atm at 734 mm Hg, 25 °C (N <sub>2</sub> =1.0)	0.001% ppm by
Solubility of water in agent	weight

0.06% ppm by weight

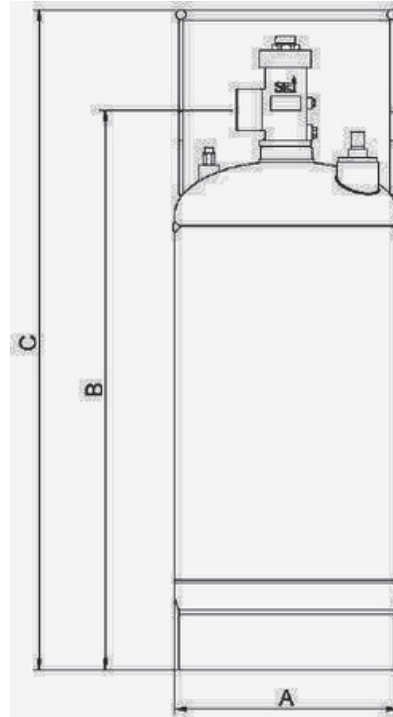
### Agent Quantity

The MARSHALL1230 Gas Suppression Systems are designed to suppress the following types of fires:

- Class A -Surface Fires / OrdinaryCombustibleFires
- Class B -FlammableLiquidFires
- Class C – Energized Electrical Equipment Fires

The extinguishing agent quantity required is based on the lowest expected ambient temperature and the design concentration required to protect the hazard area. The following design concentrations at temperature of 21 °C or 70 °F (as specified in NFPA 2001: current edition) are used to determine the required amount of agent: UL Listed FK-5-1-12 Minimum Design Concentration Tested to UL 2166

Agent	Class A Design Concentration	Class B Design	Class C
FK-5-1-12	4.5%	5.90%	4.7%



Cylinder Part Number	Cylinder Capacity	Valve Size IN (mm)	Diameter A (mm)	Length B (mm)	Length C (mm)	Min. Filling (Kg)	Max. Filling (Kg)
MH020-MS-009-EN	9	1" (25)	27	377	571	4.5	9
MH020-MS-016-EN	16	1" (25)	32	449	643	8	16
MH020-MS-032A-EN	32	1" (25) 1-1/2"	27	579	730	16	32
MH020-MS-032B-EN	32	1/2" (40)	32	584	730	16	32
MH020-MS-032B-EN	52	1-1/2" (40)	32	844	990	26	52
MH020-MS-052-EN	100	1-1/2" (40)	40	1019	1187	50	100
MH020-MS-100-EN	120	1/2" (40)	32	1182	1350	60	120
MH020-MS-120A-EN	120	1-1/2" (40)	40	1192	1350	60	120
MH020-MS-120B-EN	150	(40) 2"	32	1437	1596	75	150
MH020-MS-150-EN	180	(50)	40	1317	1493	90	180
MH020-MS-150-EN	200	2" (50)	40	1447	1623	100	200
MH020-MS-180-EN	240	2" (50)	60	1468	1656	120	240
MH020-MS-200-EN	240	2" (50)	40	1523	1656	120	240
MH021-MS-240-EN	300	2" (50)	40	1363	1506	150	300
MH031-MS-240-EN	369	3" (80)	610	1608	1751	184.5	369
		3" (80)	40				