

CLEAN AGENT FIRE SUPPRESSION SYSTEM

1. INTRODUCTION

The importance of erection, testing and commissioning are overlooked in many projects while installing and fixing Clean Agent Gas Fire Suppression System. It is a very common practice to fabricate the Clean Agent Gas Fire Suppression System including the manifold at site.

It is very difficult to ensure the proper integration of entire cylinder bank assembly which involves very high pressure and critical instrumentation such as solenoid connection, pneumatic actuation to ensure proper functioning of the entire system.

bala-wa-5112 Clean Agent Fire Suppression

High Pressure fixed installation clean agent gas cylinder banks are fully pre-assembled, integrated & tested for its proper operation at the factory itself. Customers and consultants may strongly recommend to use pre-assembled & tested **bala-wa-5112** cylinder bank assembly.

2. ENVIRONMENTAL FACTS

Environmentally acceptable fire suppression agent depends on many factors.

As a guideline by standard like NFPA, extinguishing agent should have minimum or no impact on environments.

Clean agent such as fluoro ketones (FKs) - FK-5-1-12 has Zero ODP and <1 GWP.

bala-wa-5112 Fire suppression system has Zero Ozone Depletion Potential(ODP) and <1 Global Warming Potential(GWP).

3. SYSTEM DESCRIPTION

bala-wa-5112 Clean Agent Fire Suppression Systems are usually designed based on the nature of risk, volume of risk and hazard classification. The quantity of FK-5-1-12 extinguishing agent and number of cylinders depend on the above factors. The cylinder capacities are available from 6.8 ltrs for smaller applications upto 140 ltrs for larger applications.

bala-wa-5112 cylinder banks can be provided in both modular frame assemblies and fully integrated cabinet enclosures. Cabinet enclosures can be customized with add on provisions such as inbuilt panel, in-cabinet lightning, emergency access windows, IP protections etc.,

3.1 DESIGN BASIS

FK-5-1-12 extinguishing agent has excellent extinguishing characteristics and it can put out Type A, B and C fire is non-conductive and after discharge it fast evaporates without any residue. Its minimum design concentration is 4.5% for Class A fire or Class B fire, which mostly approaches that of halon extinguishing agent.

FK-5-1-12 has a very low heat of vaporization, approximately 25 times less than that of water. This, along with a vapor pressure 12 times higher than water causes agent to evaporate faster than water. This allows the agent to transition from a liquid to a gaseous state very rapidly. When discharged through a nozzle from a properly engineered system, the agent will rapidly vaporise and evenly distribute throughout the protected space.

FK-5-1-12 extinguishes fire by removing heat. When discharged, FK-5-1-12 creates a gaseous mixture with air and this agent/air mixture has a heat capacity much larger than that of air. A higher heat capacity means that this gas mixture will absorb more heat from the risk area. At the system design concentration, the agent/air mixture absorbs sufficient heat to upset the conditions required for combustion to occur. The amount of heat the fire loses to the surroundings is increased by the presence of the agent. This causes the combustion zone to cool to the point that the fire extinguishes.



I. Part No. : IH 910 Series...
 Model No. : 34-XX*-46/Z2/D1-AC MR
Example:
 Part No : IH910-34-XX-46/Z2/D1-AC MR

Part Description : bala-wa-5112 Detection & Control Panel
 Extinguishing Cylinder Assembly

II. Part No. : IH 911 Series...
 Model No. : 34 - XX*- CT
Example:
 Part No : IH911-34-XX-CT

Part Description : bala-wa-5112 Extinguishing Cylinder kit
 Assembly

XX* - Quantity of FK-5-1-12 in Kgs

III. Part No. : IH 901 Series...
 Model No. : AA / BB / CC / DD / EE

Example:
 Part No : IH 901
 Model No : 80 / 04 / SR / FR / 60
 IH 901 : balawa-5112 Gas Fire Suppression Cylinder Bank
 Assembly using Master and Slave Cylinders
 principle

balawa-5112 : Brand Name
 FK-5-1-12 : Technical name – Dodecafluoro-2-methylpentan-3-one
 AA - Water Capacity of Cylinder (80 ltrs / 140 ltrs)
 BB - Number of Cylinder (1, 2, 3, ... XXX)
 CC - SR for Single row and DR for Dual row
 DD - Frame Type (FR) / Cabinet Type (CT)
 EE - Quantity of FK-5-1-12 in Kgs

3.2 IMPORTANT PARAMETERS IN SYSTEM DESIGN

balawa-5112 system need special design in order to achieve design concentration in the risk area within 10 seconds. Entire system needs to be designed to discharge total quantity of agent in 10 sec. This involves correct size of cylinder valve, discharge hose, header, main leading pipe network, distribution of nozzles and nozzle orifice.

AGNI CONTROLS EMPLOYS LICENSED, APPROVED, VALIDATED Vds DESIGN SOFTWARE TO ACHIEVE THE ABOVE CRITICAL PARAMETERS.

3.3 OPERATION PHILOSOPHY

The system can be operated by any one of the following method:

Automatic Detection & Automatic Extinguishing.

Manual Detection and Manual Discharge with push buttons through control panel.

Mechanical Manual Discharge by operating Manual discharge lever.

The system operates in any one of the following methods :

Automatic Detection & Automatic Extinguishing: On the receipt of fire signal from the detectors, the control panel energizes the solenoid coil, hooter, flasher, etc., as per the built in logics.

Manual Detection & Manual Discharge through the Emergency Push Buttons: When the push buttons are pressed, the fire signal is given to the control panel which performs the operations such as energizing the solenoid, hooter, flasher, etc., as per the built in logics.

Mechanical Manual Discharge by operating Manual discharge Lever in the valve: The Levers can be pushed down to directly discharge the gas without any external power source.

4. STANDARDS FOLLOWED

- ▶ National fire protection Association
(NFPA – 2001 : 2018)
- ▶ VDS 2381 : Edition 06 - 2009
- ▶ ISO 14520 - 5 : 2006

5. WHY BALAWA-5112 SYSTEM

In continuous search of Halon alternative system, clean agent gas system finds more suitable place in replacing Halon system. Unlike other Halocarbon extinguishing system FK-5-1-12 does not have any environmental effects.

PRESENTLY BALAWA-5112 CLEAN AGENT SYSTEM IS AVAILABLE AS 42 BAR (600 PSI) & 25BAR (360PSI) SYSTEM.

6. RECOMMENDED FIRE RISK AREAS

- UPS Rooms
- Control Rooms
- Communication centers
- Data centers & Computers
- Electrical Cabinets
- Electrical Switchgear
- Electronic Data Processing centers
- Storage Rooms (Non Chemical)
- Telecommunication Equipment
- Subfloors & other concealed spaces
- Libraries

	Ozone Depleting Potential	Global warming potential Vs.inert gas (100 yrs.)	Agent Breakdown to corrosive By- products
CO ₂	Zero	1	none
HFC-227ea	zero	3350	HF
FK-5-1-12	zero	<1	none

7. APPROVAL / CONFIRMATION

- ▶ System Design : Vds (Germany)
- ▶ Cylinder : PESO (India)
- ▶ Valves : Vds (Germany)
- ▶ FK-5-1-12 Clean Agent : UL Approved

8. HOW BALAWA-5112 CLEAN AGENT SYSTEM DIFFER FROM OTHERS

- Fully fabricated, integrated and tested cylinder bank assembly at factory itself. Cylinders and valves are procured from manufacturer directly with all test certificates.
- Agni Controls use licensed Vds calculation software to validate the design of the system.
- As a manufacturer, all the parts of clean agent gas systems are identified by PART number & CODE number which helps in quality assurance, spares supply & maintenance support.
- Agni Controls as a manufacturer, having and implementing well established installation procedures & commissioning procedures as per NFPA-2001.
- Agni Controls Technical man-power strength, graduate engineers & diploma engineers exceeding 50 Nos. exclusively available for gas based fire suppression system.
- Agni Controls is ISO 9001:2015 certified company for manufacturing gas suppression system and our QAP (Quality Assurance Plan) ensure proper quality of the system in all the stages.
- Agni Controls provide display of complete scheme, elaborately explaining the entire clean agent system operation.
- Agni controls factory production control is audited by LPCB (UK) annually to maintain certifications.
- Custom designed solutions for every application.

9. BALAWA-5112 CLEAN AGENT SYSTEM IS ALSO AVAILABLE IN LOW PRESSURE DEFALO AUTOMATIC FIRE DETECTION & EXTINGUISHING DIRECT & INDIRECT SYSTEMS

9.1) Part No: IH604/DD-FK5112/*
(* - 2/4/6 KGS) (DIRECT)

Description: Defalo series.. Automatic Fire DeTec Tube and FK-5-1-12 Extinguishing system.

9.2) Part No: IH604/DA-FK5112/*
(* - No. of KGS) (INDIRECT)

Description: Defalo series.. Automatic Fire DeTec Tube and FK-5-1-12 Extinguishing system through Nozzle.



10. OTHER RANGE OF SYSTEMS

- ☑ **balawa series...** CO₂ Gas Fire Suppression System & Components.
- ☑ **fladet series...** Special Application Flame / Ember / Spark / Probe type heat Detectors
- ☑ **balawa series...** IG541 / IG55 Inert Gas Fire Suppression system & components
- ☑ **Defalo series..** Detect & Extinguish System
- ☑ **balawa series...** Textile Fire Protection & Diversion System
- ☑ **balawa-mist series..** Engineered High / Low Pressure Water Mist Fire Suppression System

bala-wa® SERIES...
Fire Suppression Systems



fladet® SERIES...
THE GLOBAL INDIAN BRAND

**Flame / Ember / Spark /
Probe Type Heat Detectors**

