



**RICHMOND**<sup>®</sup>  
FIRE INTERNATIONAL

# RICHMOND 5112

CLEAN AGENT FIRE SUPPRESSION SYSTEM

[www.richmondfire.de](http://www.richmondfire.de)



## RICHMOND 5112 CLEAN AGENT

RICHMOND 5112 is a trademark of RICHMOND's FK-5-1-12, Dodecafluoro-2-methylpentan-3-one. FK-5-1-12 is another widely used extinguishing clean agent. It is environmentally safe and best used in fire hazard areas containing A, B, & C classes of fire. It has been approved by US EPA and ISO for its safe characteristic and fire extinguishing effectiveness.

RICHMOND 5112 is ideal for use in total flooding applications, localized flooding systems, directional spray type applications and can be used in portable extinguishers for specialized applications.

RICHMOND 5112 is an acceptable alternative clean agent for Halon 1301 replacement and it is guaranteed that meets the minimum NFPA 2001 Requirement as follows.

## PHYSICAL & CHEMICAL PROPERTIES

IUPAC Name	1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone
ASHRAE Designation	FK-5-1-12
Synonym	Dodecafluoro-2methylpentan-3-one
CAS Registry Number	756-13-8
Chemical Formula	$\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$
Molecular Weight	316.04
Freezing Point	-162.4°F (-108°C)
Boiling Point at 760 mmHg	120.2°F (49°C)
Critical Temperature	335.6°F (168.66°C)
Critical Density	39.91 lbm/ft <sup>3</sup> (639.1 kg/m <sup>3</sup> )
Critical Pressure	270.44 psi (1,865 kPa)
Critical Volume	0.0251 ft <sup>3</sup> /lbm (494.5 cc/mole)
Viscosity, Liquid at 77°F (25°C)	1.27 lb/ft-hr (0.524 cP)
Solubility in Water at 70°F (21.1°C)	<0.001% by weight
Purity	99.0% (minimum)
Non-Volatile Residue (g/100ml)	0.05
Ozone Depletion Potential (ODP)	0
Global Warming Potential (GWP)	≤1
Atmospheric Lifetime (ATL)	0.014 years
US EPA SNAP	Yes

## APPROVALS



**RICHMOND FIRE International GmbH**

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## 1200 LB (500 KG) Clean Agent Storage Tank

1200 lb (500 kg) RICHMOND 5112 Storage Tanks are offered by RICHMOND FIRE INTERNATIONAL to make it easy for storage and transferring of large quantities of FK-5-1-12 agent from one place to another. The 500 kg Storage Tank is specially design for maximum transfer of FK-5-1-12 with transfer valves located at the top of Tank. This storage tank is made of stainless steel and non-corrosive material.

A 20 foot shipping container can carry 40 nos. of the 500 kg Storage Tank which maximises ocean freight cost.

## SPECIFICATIONS

Water Capacity	330 L
Medium	Non-toxic, non-flammable
Design Pressure (Int. Ext.) psi	Atmospheric Pressure
Design Temperature °C	Room Temperature
Operating Pressure (Int. Ext.) psi	Atmospheric Pressure
Operating Temperature °C	50°C
Main Material	S30408
Corrosion Allowance	0
Total Height	1143 mm
Outside Diameter	753 mm



RM 7901200-ST

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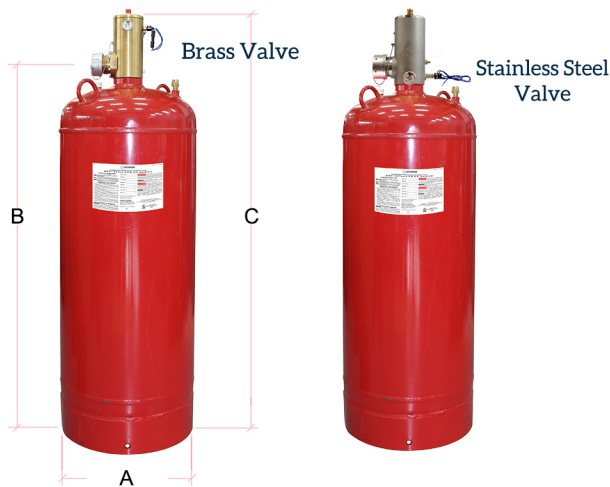


## RICHMOND 5112 CLEAN AGENT SYSTEM

### RICHMOND 5112 CLEAN AGENT ENGINEERED CYLINDERS (360 PSI SYSTEM)

Richmond Fire Suppression System uses FK-5-1-12 extinguishing agent that is stored in extinguishing cylinders until system activation. All Clean Agent cylinders are manufactured and tested in accordance with DOT special design requirements. Richmond cylinders are equipped with back pressure type valve.

The quantity of agent required for each enclosure can be calculated through Richmond's Flow Calculation Software Version RM 4.0, which contains a sophisticated calculation routine for predicting the two-phase as well as two-component flow of agent and nitrogen through the distribution piping network in quasi-steady state from the initiation of the discharge to final gas blow down. The cylinder is then super-pressurized with dry nitrogen to 360 psi at 70°F to provide extinguishment in 10 seconds or less.



#### FEATURES

- The cylinder assembly includes a welded cylinder filled with FK-5-1-12 Clean Agent
- Each cylinder is equipped with a special high-speed opening cylinder valve
- Valves are available in:  
Brass Valve: 1", 1 1/2", 2 1/2"  
Stainless Steel Valve: 1", 1 1/2", 2 1/2", 3", 4"
- Cylinders can only be installed in the upright position.
- Valve is appropriate for high discharge rates and makes the extinguishant discharge possible within 10 seconds.
- Includes a pressure gauge for indication of the filling pressure.
- Includes a burst disc to protect from excessive pressure.
- Uses a piston actuator as a pressure operated switch in the cylinder discharge of multiple cylinders installation
- Includes Electric Solenoid (24 VDC 15 Watts & 12 VDC 15 Watts) To automatically start and operate the clean agent discharge based on the operating specification requirements.
- Used Low Pressure Supervisory Switch to monitor the internal pressure of the cylinder
- Cylinder fill density is dependent on the area of protection size.
- A cylinder nameplate label is attached to the extinguishing agent container. Contains maintenance and filling information, as well as information about the filling quantity.
- Engineered Cylinders sizes are available in 20lb, 35lb, 70lb, 100lb, 150lb, 250lb, 375lb, 560lb, 650lb, 800lb, 1000lb, & 1200lb.
- Each basic sizes can be filled with one pound increments to meet the exact amount of FK-5-1-12 Clean Agent required.
- Temperature Range: 32°F (0°C) to 130°F (54.4°C)
- System Operating Pressure: 360 psi at 70°F (25.3 kg<sub>f</sub>/cm<sup>2</sup> at 21.1°C)
- All Cylinder labels and paint works are UL Approved

#### RICHMOND 5112 CLEAN AGENT ENGINEERED CYLINDERS ARE AVAILABLE IN THE FOLLOWING CAPACITIES:

Part Number	Cylinder Size	Max Fill at 75lb/ft <sup>3</sup>	Min Fill at 35lb/ft <sup>3</sup>	Valve Size	A	B	C
RM 7800020-A*	20lb	21.0lb	11lb	1" Valve	10.750"	13.632"	18.633"
RM 7800035-A*	35lb	38.0lb	18lb	1" Valve	10.750"	18.677"	23.678"
RM 7800070-A*	70lb	76.0lb	36lb	1" Valve	10.750"	28.166"	33.167"
RM 7800100-A*	100lb	108.0lb	51lb	1" Valve	12.795"	26.709"	31.709"
RM 7800150-A*	150lb	163lb	77lb	1 1/2" Valve	12.795"	37.343"	43.172"
RM 7800250-A*	250lb	271lb	127lb	1 1/2" Valve	16"	40.009"	45.928"
RM 7800375-A*	375lb	406lb	190lb	2 1/2" Valve	16"	57.248"	65.351"
RM 7800560-A*	560lb	601lb	281lb	2 1/2" Valve	20"	55.516"	63.619"
RM 7800650-A*	650lb	712lb	333lb	2 1/2" Valve	20"	63.335"	71.438"
RM 7800650-B	650lb	712lb	333lb	3" Valve	30"	63.805"	72.569"
RM 7800800-A	800lb	900lb	420lb	3" Valve	30"	45.167"	55.463"
RM 7800800-B	800lb	900lb	420lb	4" Valve	30"	47.404"	57.254"
RM 7801000-A	1000lb	1112lb	520lb	3" Valve	30"	52.136"	62.431"
RM 7801000-B	1000lb	1112lb	520lb	4" Valve	30"	54.767"	64.617"
RM 7801200-A	1200lb	1297lb	606lb	4" Valve	30"	62.135"	71.985"

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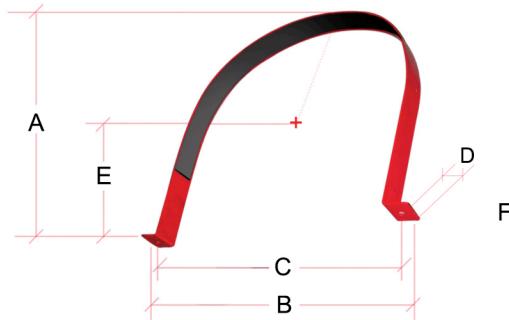
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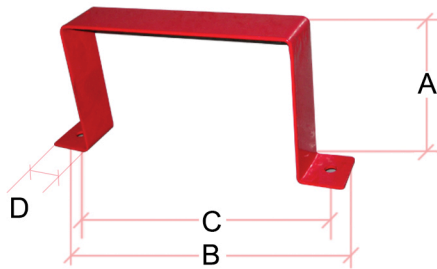


## RICHMOND 5112 ENGINEERED CYLINDER BRACKETS (360 PSI SYSTEM)

RICHMOND FIRE cylinder bracket is manufactured from galvanized steel band formed to the radius of the cylinder with flanges for bolting to the continuous slot metal framing channel of 12-gauge steel with corrosion resistant paint or galvanized. The cylinder bracket must be secured to a surface that the bracket will withstand a load up to 5 times of the cylinder weight. This precaution is to have the bracket safely supports the weight of the cylinder and the reaction force of the FK-5-1-12 Clean Agent when discharge.



Bracket Part #	Cylinder Size	Cylinder O.D	Straps #	A	B	C	D	E	F
RM 7911107-W	20lb	10.00"	1	11"	14"	12.6"	1.5"	5.6"	2"
RM 7911107-W	35lb	10.00"	1	11"	14"	12.6"	1.5"	5.6"	2"
RM 7911107-W	70lb	10.00"	1	11"	14"	12.6"	1.5"	5.6"	2"
RM 7911128-W	100lb	12.75"	1	13"	16.05"	14.65"	1.65"	6.475"	2"
RM 7911128-W	150lb	12.75"	1	13"	16.05"	14.65"	1.65"	6.475"	2"
RM 7911160-W	250lb	16.00"	1	16.25"	19.2"	17.7"	1.5"	8.2"	2"
RM 7911160-W	375lb	16.00"	2	16.25"	19.2"	17.7"	1.5"	8.2"	2"
RM 7911200-W	560lb	20.00"	2	20.25"	23.2"	21.7"	1.5"	12.2"	2"
RM 7911200-W	650lb	20.00"	2	20.25"	23.2"	21.7"	1.5"	12.2"	2"
RM 7911300-W	800lb	30.00"	2	30.225"	35.2"	33.2"	2.5"	15.225"	2"
RM 7911300-W	1000lb	30.00"	2	30.225"	35.2"	33.2"	2.5"	15.225"	2"
RM 7911300-W	1200lb	30.00"	2	30.225"	35.2"	33.2"	2.5"	15.225"	2"



RM 7911059

Bracket Part #	Cylinder Size	Cylinder O.D	A	B	C	D	E	F
RM 7911059-F	800lb	30.00"	5"	11.5"	10.35"	1.5"	N/A	2"
RM 7911059-F	1000lb	30.00"	5"	11.5"	10.35"	1.5"	N/A	2"
RM 7911059-F	1200lb	30.00"	5"	11.5"	10.35"	1.5"	N/A	2"



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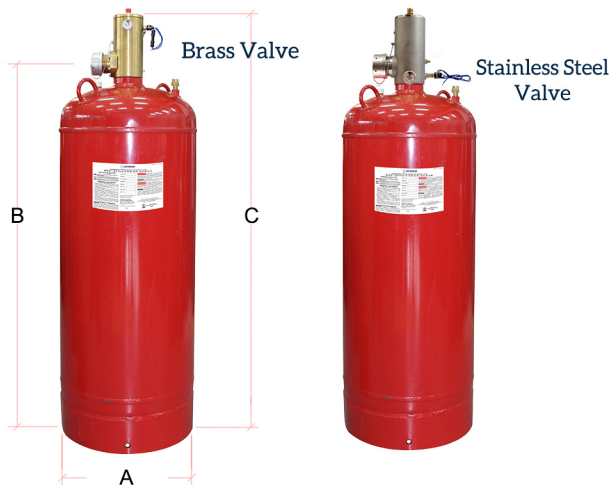
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## RICHMOND 5112 CLEAN AGENT ENGINEERED CYLINDERS (500 PSI SYSTEM)

Richmond Fire Suppression System uses FK-5-1-12 extinguishing agent that is stored in extinguishing cylinders until system activation. All Clean Agent cylinders are manufactured and tested in accordance with DOT special design requirements. Richmond cylinders are equipped with back pressure type valve.

The quantity of agent required for each enclosure can be calculated through Richmond's Flow Calculation Software Version RM 4.0, which contains a sophisticated calculation routine for predicting the two-phase as well as two-component flow of agent and nitrogen through the distribution piping network in quasi-steady state from the initiation of the discharge to final gas blow down. The cylinder is then super-pressurized with dry nitrogen to 500 psi at 70°F to provide extinguishment in 10 seconds or less.



### FEATURES

- The cylinder assembly includes a welded cylinder filled with FK-5-1-12 Clean Agent
- Each cylinder is equipped with a special high-speed opening cylinder valve
- Valves are available in:  
Brass Valve : 1", 1 1/2", 2 1/2"  
Stainless Steel Valve: 1", 1 1/2", 2 1/2", 3" & 4"
- Cylinders can only be installed in the upright position.
- Valve is appropriate for high discharge rates and makes the extinguishant discharge possible within 10 seconds.
- Includes a pressure gauge for indication of the filling pressure.
- Includes a burst disc to protect from excessive pressure.
- Uses a piston actuator as a pressure operated switch in the cylinder discharge of multiple cylinders installation
- Includes Electric Solenoid (24 VDC 15 Watts & 12 VDC 15 Watts) To automatically start and operate the clean agent discharge based on the operating specification requirements.
- Used Low Pressure Supervisory Switch to monitor the internal pressure of the cylinder
- Cylinder fill density is dependent on the area of protection size.
- A cylinder nameplate label is attached to the extinguishing agent container. Contains maintenance and filling information, as well as information about the filling quantity.
- Engineered Cylinders sizes are available in 20lb, 35lb, 70lb, 100lb, 150lb, 250lb, 375lb, 560lb, 650lb, 800lb & 1200lb.
- Each basic sizes can be filled with one pound increments to meet the exact amount of FK-5-1-12 Clean Agent required.
- Temperature Range: 32°F (0°C) to 130°F (54.4°C)
- System Operating Pressure: 500 psi at 70°F (35.2 kg./cm<sup>2</sup> at 21.1°C)
- All Cylinder labels and paint works are UL Approved

### RICHMOND 5112 CLEAN AGENT ENGINEERED CYLINDERS ARE AVAILABLE IN THE FOLLOWING CAPACITIES:

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Note: \* add "-SS" if valve is Stainless Steel Valve

### APPROVAL



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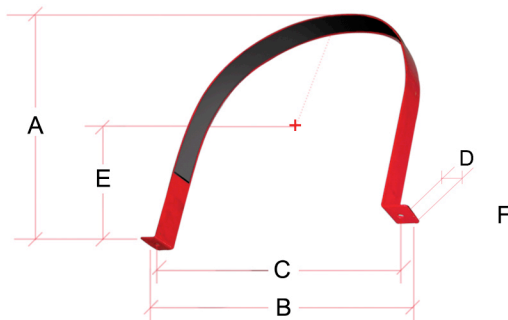
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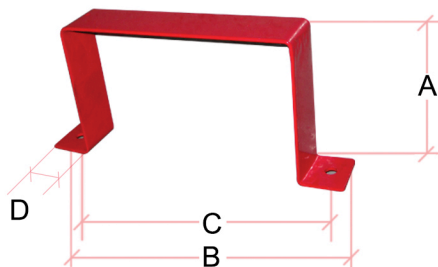


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RM 7911107-W	35lb	10.00"	1	11"	14"	12.6"	1.5"	5.6"	2"
RM 7911107-W	70lb	10.00"	1	11"	14"	12.6"	1.5"	5.6"	2"
RM 7911128-W	100lb	12.75"	1	13"	16.05"	14.65"	1.65"	6.475"	2"
RM 7911128-W	150lb	12.75"	1	13"	16.05"	14.65"	1.65"	6.475"	2"
RM 7911160-W	250lb	16.00"	1	16.25"	19.2"	17.7"	1.5"	8.2"	2"
RM 7911160-W	375lb	16.00"	2	16.25"	19.2"	17.7"	1.5"	8.2"	2"
RM 7911200-W	560lb	20.00"	2	20.25"	23.2"	21.7"	1.5"	12.2"	2"
RM 7911200-W	650lb	20.00"	2	20.25"	23.2"	21.7"	1.5"	12.2"	2"
RM 7911300-W	800lb	30.00"	2	30.225"	35.2"	33.2"	2.5"	15.225"	2"
RM 7911300-W	1000lb	30.00"	2	30.225"	35.2"	33.2"	2.5"	15.225"	2"
RM 7911300-W	1200lb	30.00"	2	30.225"	35.2"	33.2"	2.5"	15.225"	2"



RM 7911059

Bracket Part #	Cylinder Size	Cylinder O.D	A	B	C	D	E	F
RM 7911059-F	1200lb	30.00"	5"	11.5"	10.35"	1.5"	N/A	2"

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### VALVES ASSEMBLY

#### *Brass Valves*



1" Brass Valve  
Brass, ASTM B-16  
P/N: RM 7920010-B



1 1/2" Brass Valve  
Brass, ASTM B-16  
P/N: RM 7920015-B



2 1/2" Brass Valve  
Brass, ASTM B-16  
P/N: RM 7920025-B

#### *Stainless Steel Valves*



1" Stainless Steel Valve  
SS, AISI 304/ 316/ 316L  
P/N: RM 7920010-SS



1 1/2" Stainless Steel Valve  
SS, AISI 304/ 316/ 316L  
P/N: RM 7920015-SS



2 1/2" Stainless Steel Valve  
SS, AISI 304/ 316/ 316L  
P/N: RM 7920025-SS



3" Stainless Steel Valve  
SS, AISI 304/ 316/ 316L  
P/N: RM 7920030-SS



4" Stainless Steel Valve  
SS, AISI 304/ 316/ 316L  
P/N: RM 7920040-SS

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