

# SAPPHIRE<sup>®</sup> PLUS TOTAL FLOOD FIRE SUPPRESSION SYSTEM

## Features and Benefits

- UL/ULC Listed and FM Approved
- Fully meets EN 12094
- Designs according to EN 15004, ISO 14520 and NFPA 2001
- UL and FM verified software
- Selector valve systems
- Available with standard pressure gauge or contacted pressure gauge for pressure monitoring
- Electric, pneumatic or manual operation
- Operating range of -20 °C to 50 °C (UL, FM and CE) or 0 °C to 65 °C (UL and FM)
- Manufactured in the EU
- Centralized storage locations
- Reduced pipe diameters for traditional systems

## Applications

Conventional SAPPHIRE<sup>®</sup> systems use a storage pressure of 25 bar or 42 bar, which is suitable for many applications. The SAPPHIRE PLUS system uses a storage pressure of 70 bar to provide the designer with more flexibility when planning the layout of the system. The higher pressure means the containers can be placed further from the hazard area (if required), the use of smaller pipe diameters, and the use of selector valves to protect multiple areas using one bank of containers.

## Description

The storage pressure of the SAPPHIRE PLUS system is determined by the quantity of nitrogen added to the container during the filling process to reach a state of super pressurization. The greater the quantity of nitrogen added to the container results in a higher storage pressure capable of driving the agent further, leading to greater flexibility during the planning and layout of the system.

## Approvals and Listings

- UL Listed
- FM Approved
- CE Marked



E000124

## Specifications

Environmental Data	
Ozone Depletion Potential (ODP):	0
Global Warming Potential (GWP):	1
Atmospheric Lifetime (ALT):	3 to 5 days
Operating and storage temperature:	-20 °C to 50 °C (UL, FM and CE) 0 °C to 65 °C (UL and FM)

Physical Properties of 3M <sup>™</sup> Novec <sup>™</sup> 1230 Fluid		
Properties	Unit	Value
Molecular mass:	-	316.04
Boiling point at 1013 bar (absolute):	°C	49.2
Freezing point:	°C	-108.0
Vapor pressure 20 °C:	bar abs*	0.3260
Liquid density 20 °C:	g/ml	1.616
Saturated vapor density 20 °C:	kg/m <sup>3</sup>	4.3305
Heat of vaporization at boiling point:	kJ/kg	88.0
Chemical formula:	CF <sub>3</sub> CF <sub>2</sub> C(O)CF(CF <sub>3</sub> ) <sub>2</sub>	
Chemical name:	Dodecafluoro-2-methylpentan-3-one	

\* 1 bar = 0.1 MPa = 100,000 Pa; 1 MPa = 1 N/mm<sup>2</sup>

## Ordering Information

SAPPHIRE PLUS container assembly – TPED (70 bar) complete with Standard Pressure Gauge									
Part number	Description	Height to Outlet (mm)	Diameter (mm)	Nominal Tare Weight (kg)	Min. Agent Weight (kg)	Max. Agent Weight (kg)	Nominal Gross Weight (excluding N <sup>2</sup> ) (kg)	Manifold bracket height without AHA (mm)	Manifold bracket height with AHA (mm)
303700001	15 L (TPED) 50 °C PG	694	204	29.3	4.5	21	50.3	1151	1308
303700002	30 L (TPED) 50 °C PG	972	229	38.8	9	42	80.8	1428	1585
303700003	45 L (TPED) 50 °C PG	1071	267	60.4	14	63	123.4	1528	1685
303700004	60 L (TPED) 50 °C PG	1425	267	80.1	18	84	164.1	2005	2177
303700005	120 L (TPED) 50 °C PG	1546	360	140.6	36	168	308.6	2126	2298
303700006	180 L (TPED) 50 °C PG	1783	406	214.8	54	252	466.8	2468	2640
303700013	15 L (TPED) 65 °C PG	694	204	29.3	4.5	20.3	49.6	1151	1308
303700014	30 L (TPED) 65 °C PG	972	229	38.8	9	41	79.3	1428	1585
303700015	45 L (TPED) 65 °C PG	1071	267	60.4	14	60.8	121.2	1528	1685
303700016	60 L (TPED) 65 °C PG	1425	267	80.1	18	81	161.1	2005	2177
303700017	120 L (TPED) 65 °C PG	1546	360	140.6	36	162	302.6	2126	2298
303700018	180 L (TPED) 65 °C PG	1783	406	214.8	54	243	457.8	2468	2640

SAPPHIRE PLUS container assembly – TPED (70 bar) complete with Contacted Pressure Gauge									
Part number	Description	Height to Outlet (mm)	Diameter (mm)	Nominal Tare Weight (kg)	Min. Agent Weight (kg)	Max. Agent Weight (kg)	Nominal Gross Weight (excluding N <sup>2</sup> ) (kg)	Manifold bracket height without AHA (mm)	Manifold bracket height with AHA (mm)
303700007	15 L (TPED) 50 °C CPG	694	204	29.3	4.5	21	50.3	1151	1308
303700008	30 L (TPED) 50 °C CPG	972	229	38.8	9	42	80.8	1428	1585
303700009	45 L (TPED) 50 °C CPG	1071	267	60.4	14	63	123.4	1528	1685
303700010	60 L (TPED) 50 °C CPG	1425	267	80.1	18	84	164.1	2005	2177
303700011	120 L (TPED) 50 °C CPG	1546	360	140.6	36	168	308.6	2126	2298
303700012	180 L (TPED) 50 °C CPG	1783	406	214.8	54	252	466.8	2468	2640
303700019	15 L (TPED) 65 °C CPG	694	204	29.3	4.5	20.3	49.6	1151	1308
303700020	30 L (TPED) 65 °C CPG	972	229	38.8	9	41	79.3	1428	1585
303700021	45 L (TPED) 65 °C CPG	1071	267	60.4	14	60.8	121.2	1528	1685
303700022	60 L (TPED) 65 °C CPG	1425	267	80.1	18	81	161.1	2005	2177
303700023	120 L (TPED) 65 °C CPG	1546	360	140.6	36	162	302.6	2126	2298
303700024	180 L (TPED) 65 °C CPG	1783	406	214.8	54	243	457.8	2468	2640

**Note:** AHA (Adjustable height adaptor)

- SAPPHIRE PLUS systems are configured around six TPED seamless container valve assemblies.
- Each container assembly consists of a container complete with transport cap, valve assembly with either a standard or contacted pressure gauge, and a container label (ordered separately).
- Each container assembly is pressurized with dry nitrogen to 70 bar (+2 bar, -0 bar) at 20 °C.
- Containers must not be stored in direct sunlight, in adverse weather conditions, and must not be positioned where water can accumulate around the base.
- Containers are manufactured in accordance with ISO 9809-1 and ISO 9809-2, as applicable, and are stamped TPED with a working pressure of 120 bar and a hydraulic test pressure of 200 bar.

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