



Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	
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Product designation

Muster^{II}, M2IPS Series, impulse powder system modules

(Refer to the Schedule/enclosures for further specified details)

Agent/distributor

JSG Industrial Systems Pty Ltd
U1 / 21 Amour Street, REVESBY, NSW, AUSTRALIA, 2212

Producer representative

Pyrogen (Australia) Pty Ltd
18 Barry Avenue, MORTDALE, NSW, AUSTRALIA, 2223

Producer

Pyrogen Technologies (Aust) Pty Ltd
18 Barry Avenue, MORTDALE, NSW, AUSTRALIA, 2223

Conformance criteria and evaluation

The Muster^{II}, M2IPS Series, impulse powder system modules has been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. Australian Standard AS 4487-2013, 'Condensed aerosol fire extinguishing systems— Requirements for system design, installation and commissioning and test methods for components'.
2. International Standard ISO 15779:2011, 'Condensed aerosol fire extinguishing systems - Requirements and test methods for components and system design, installation and maintenance - General requirements'.
3. Australian Standard AS 1851-2012, 'Routine service of fire protection systems and equipment'.
4. NFPA Standard NFPA 2010-2006, 'Aerosol Fire Extinguishing Systems'.
5. Underwriters Laboratories Standard UL 2127, Edition 1, 'Standard for Inert Gas Clean Agent Extinguishing System Units'.

This certification is issued within the scope of CSIRO Verification Services – Rules governing ActivFire Scheme and is valid only for the product(s) as submitted for evaluation and verification of conformity, subject to the following conditions.

- Reference to details, limitations and requirements, where documented as a schedule/enclosure with this certificate.
- The Registrant is responsible for their attestation of conformity and ensuring that on-going production complies with the conformance criteria defined in this certificate.
- This certificate will not be valid if any changes or modifications are made to the product which have not been notified and validated by CSIRO Verification Services.
- This certificate is subject to periodical re-validation upon verification that all requirements, as determined by the conformity assessment body, continue to be satisfactorily met by the Registrant.
- This certificate may only be reproduced in its published form, without modification and inclusive of all schedules/enclosures.
- Any changes, errors or omissions, must be submitted in writing and if necessary or requested, substantiated with relevant evidence.
- Any representations, such as advertising or other marketing related activities or articles shall reflect the correct contents of this certificate and conform with all relevant trade practices and consumer protection legislation and regulations.
- Any terms or conditions of use as applicable to content and documentation as published or accessed through web sites administered by the CSIRO Verification Services.

Issued by

David Whittaker
Executive Officer – ActivFire Scheme



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Limitations/conditions of conformance

Limitations/conditions of conformance, where identified on this certificate, are derived from qualifications from evaluation(s) for conformity and/or other related technical documentation. All details with respect to design, assembly and installation instructions and restrictions should be checked against the producer's current technical manual/data sheets and the requirements of the Authority having Jurisdiction.

Specified limitations/conditions, determined from the evaluation for conformity, include the following.

- i. For use only where the ambient temperature of the M2IPS generators will be between -50 and +50°C (standard M2IPS models) and from -50 to 85°C for transport applications (M2IPS-T models). System design and installation shall be done strictly in accordance with the Muster^{II}, M2IPS Technical Manual.
- ii. Muster^{II}, M2IPS Series, impulse powder system modules are not suitable for fires involving the following:
 - Certain chemicals or mixtures of chemicals such as cellulose nitrate and gunpowder, which are capable of rapid oxidation in the absence of air.
 - Reactive metals such as sodium, potassium, magnesium, titanium, zirconium, uranium, and plutonium.
 - Metal hydrides or metal amides.
 - Chemicals capable of undergoing auto-thermal decomposition such as certain organic peroxides and hydrazine.
 - Pyrophoric materials such as white phosphorous or metal-organic compounds.
 - Oxidising agents such as nitric oxides and fluorine.
- iii. Intended to be used in un-occupiable and normally unoccupied areas.

Producer's description

The Muster^{II}, M2IPS Series, impulse powder system modules are a pre-engineered compact, un-pressurised, electrically-actuated fixed fire protection system which extinguishes fire by using an extremely fine low settling-rate chemical dry-powder plus inert gases. The powder particles are induced into the fire and quickly cause complete chemical inhibition of the fire's radical-forming chain reactions. This, together with the oxygen dilution and cooling produced by the inert gases, rapidly extinguishes the flaming combustion of most fuels.

One or several M2IPS modules can be used in local applications (protection of an individual object) or in total flooding applications (protection of a total enclosure volume). M2IPS modules are thus intended for both area and volume protection. M2IPS modules use standard ABC powder.

The modules are intended for suppressing and extinguishing fires of solid combustible materials, flammable liquids and electrical equipment, i.e. Classes A, B, C, & E. They are not suitable for potential fires involving materials that burn without access of air as well as of alkali and alkali earth metals.

M2IPS modules have been designed for use in the temperature operation range from -50°C to +50°C for normal industrial applications (standard M2IPS modules) and from -50°C to +85°C for transport and mobile equipment applications (transport M2IPS-T modules). M2IPS modules have been designed for use under relative air humidity up to 95%. M2IPS-T modules have been designed to withstand high vibration and aggressive environment impacts.

M2IPS modules are intended for protection of enclosed, semi-enclosed and open areas and equipment.

Examples of enclosed areas include garages, warehouses, various industrial, commercial and equipment enclosures, under floor and above false ceiling areas and etc.

Examples of semi-enclosed areas include engine and other compartments in vehicles, locomotive and rolling stock, cable tunnels, coal conveyors, mobile equipment, heavy machinery and etc. Examples of open areas include open transformers, transport, rolling stock, mobile equipment and etc. M2IPS is a non-pressurised dry powder module with an impulse (less than 1s) or rapid (less than 5s) discharge pattern of the powder. Such discharge pattern provides extremely fast delivery of the extinguishing powder to a fire zone as well as aeration of the powder prior to its discharge, thus ensuring instantaneous suppression of fire, low powder consumption and minimal powder loss. Non-pressurised modules provide additional advantage of simple installation, minimal maintenance and ability to install them inside the protected area.

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Technical specification

The following details are a representative extract of the technical specification for the Muster[®], M2IPS Series, impulse powder system modules and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

Schedule of variant designations

The following is a schedule of validated variant designations of the certified/listed equipment.

Module	Mass of module / powder, kg	Dimensions diameter / height, mm	Extinguishing efficiency				Max install height, m	Discharge time, s	Activation current, A / activation time, s
			Area protection, m ²		Volume protection, m ³				
			Class A	Class B	Class A	Class B			
M2IPS-0.3; -0.3T	0.75/0.3	55/280	1	1	1.2	1.2	1.2	0.1	0.4 /2
M2IPS-0.5; -0.5T	1.7/0.48	76/236	2	2	2	2	2.0	0.5	0.1-0.4/5
M2IPS-0.5(T)exp	1.85/0.47	76/236	2	2	2	2	2.0	0.5	0.1-0.4/5
M2IPS-2; -2T	4.7/1.65	100/435	10	7	15	8-11	1.9	1.0	0.1-0.4/10
M2IPS-2(T)exp	5.4/1.65	100/435	10	7	15	8-11	1.9	1.0	0.1-0.4/10
M2IPS-2.5	2.9/1.95	250/140	7	7	18	16	3.5	0.5	0.1-0.4/2
M2IPS-2.5exp	3.6/1.95	250/170	7	7	18	16	3.5	0.5	0.1-0.4/2
M2IPS-5-W; -T	7.5/5.0	250/400	23	15	46	30	6	1	0.1-0.4/10
M2IPS-7T	12.0/6.0	300/450	20	18	40	35		4	0.7/4
M2IPS-8-R	14.5/7.5	300/450	32	18	64	35	6	3	0.7/5
M2IPS-8-M	12.0/7.0	250/350	32	21	64	42	3.5	1	0.1-0.4/15
M2IPS-8-H	12.0/7.0	250/390	24	16	48	32	6.0	1	0.1-0.4 /15
M2IPS-8-W	13.0/7.0	267/320	32	20	64	31	3.5	1	0.1-0.4/15
M2IPS-8-Mexp	12.7/7.0	250/350	32	21	64	42	3.5	1	0.1-0.4/15
M2IPS-8-Hexp	12.7/7.0	250/380	24	16	48	32	6.0	1	0.1-0.4 /15
M2IPS-8-Wexp	13.7/7.0	250/350	32	20	64	31	3.5	1	0.1-0.4/15
M2IPS-8T-M	13.0/7.0	250/316	32	21	64	42	3.5	1	0.1-0.4/15
M2IPS-8T-H	13.0/7.0	250/346	24	16	48	32	6.0	1	0.1-0.4 /15
M2IPS-8T-W	13.0/7.0	258/306	32	20	64	31	3.5	1	0.1-0.4/15
M2IPS-15	24.0/14.5	300/450	48	42	96	84	6	1	0.7/5
M2IPS-15exp	25.0/14.5	300/450	48	42	96	84	6	1	0.7/5
M2IPS-15R;-T	24.0/14.5	300/450	42	36	85	70	6	5	0.7/5
M2IPS-15Rexp	25.0/14.5	300/450	42	36	85	70	6	5	0.7/5
M2IPS-50R;-T	75.0/48.0	300/900	75	60	210	180	6	5	0.7/5
M2IPS-50Rexp	75.0/48.0	300/900	75	60	210	180	6	5	0.7/5

Schedule of components and/or assemblies

The following is a schedule of validated components of the certified/listed equipment.

Description	Part num.
Pipe Shape 0.3 kg	M2IPS-0.3
Transport model 0.5kg	M2IPS-0.5
Transport model Explosion protection 0.5kg	M2IPS-0.5-exp
Transport model 2.0kg	M2IPS-2
Transport model Explosion protection 2.0kg	M2IPS-2-exp
Oyster Shape 2.5 kg	M2IPS-2.5
Oyster Shape Explosion protection 2.5 kg	M2IPS-2.5-exp
Wall mounted 5.0 kg	M2IPS-5W
Model for Transport 7.0 kg	M2IPS-7
M - Medium-height	M2IPS-8M
H- Large-height	M2IPS-8H
W - Wall mounted	M2IPS-8W
M - Medium-height Thermal Activation	M2IPS-8T-M
H- Large-height Thermal Activation	M2IPS-8T-H
W - Wall mounted Thermal Activation	M2IPS-8T-W
M - Medium-height	M2IPS-8M-exp
H- Large-height	M2IPS-8H-exp
W - Wall mounted	M2IPS-8W-exp
Impulse Discharge	M2IPS-15
Impulse Discharge Explosion protection	M2IPS-15-exp

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Description	Part num.
R-rapid discharge throw out nozzle Model for Transport 15.0 kg	M2IPS-15 R
R-rapid discharge throw out nozzle Explosion protection	M2IPS-15 R-exp
R-rapid discharge throughout pipe with nozzles Model for Transport 15.0 kg	M2IPS-50 R
R- rapid discharge throughout pipe with nozzles	M2IPS-50 R-exp
M- Medium-height conical diffuser	M2IPS-VHCD-90/360
H- Large-height conical diffuser	M2IPS-HHCD-60/360
W - Wall mounted hemispherical diffuser	M2IPS-WMHD-90/360
Bronze nozzle diameter 46mm	M2IPS-BN-46-90/360
Bronze nozzle diameter 46mm with protective cup	M2IPS-BNPC-46-90/360
Nozzle full cone	M2IPS-NFC-30/360
Nozzle full cone	M2IPS-NFC-45/360
Nozzle full cone	M2IPS-NFC-60/360
Nozzle full cone	M2IPS-NFC-90/360
Nozzle full cone	M2IPS-NFC-120/360
Nozzle full cone	M2IPS-NFC-180/360
Nozzle full cone	M2IPS-NFC-270/360
Nozzle full cone	M2IPS-NFC-30/180
Nozzle full cone	M2IPS-NFC-45/180
Nozzle full cone	M2IPS-NFC-60/180
Nozzle full cone	M2IPS-NFC-90/180
Nozzle full cone	M2IPS-NFC-120/180
Nozzle full cone	M2IPS-NFC-180/180
Nozzle full cone	M2IPS-NFC-270/180
Nozzle full cone	M2IPS-NFC-30/90
Nozzle full cone	M2IPS-NFC-45/90
Nozzle full cone	M2IPS-NFC-60/90
Nozzle full cone	M2IPS-NFC-90/90
Nozzle full cone	M2IPS-NFC-120/90
Nozzle full cone	M2IPS-NFC-90/90
Nozzle full cone	M2IPS-NFC-270/90
Nozzle hollow cone	M2IPS-NHC-30/360
Nozzle hollow cone	M2IPS-NHC-45/360
Nozzle hollow cone	M2IPS-NHC-60/360
Nozzle hollow cone	M2IPS-NHC-90/360
Nozzle hollow cone	M2IPS-NHC-120/360
Nozzle hollow cone	M2IPS-NHC-180/360
Nozzle hollow cone	M2IPS-NHC-270/360
Nozzle hollow cone	M2IPS-NHC-30/180
Nozzle hollow cone	M2IPS-NHC-45/180
Nozzle hollow cone	M2IPS-NHC-60/180
Nozzle hollow cone	M2IPS-NHC-90/180
Nozzle hollow cone	M2IPS-NHC-120/180
Nozzle hollow cone	M2IPS-NHC-180/180
Nozzle hollow cone	M2IPS-NHC-270/180
Nozzle hollow cone	M2IPS-NHC-30/90
Nozzle hollow cone	M2IPS-NHC-45/90
Nozzle hollow cone	M2IPS-NHC-60/90
Nozzle hollow cone	M2IPS-NHC-90/90
Nozzle hollow cone	M2IPS-NHC-120/90
Nozzle hollow cone	M2IPS-NHC-90/90
Nozzle hollow cone	M2IPS-NHC-270/90
FireChase Detection and Actuation System With Isolation Switch	M2IPS-101 2ZWDIS
FireChase Detection and Actuation System	M2IPS-102 2ZD
FireChase Detection system two circuit	M2IPS-103 2ZIP
FireChase Detection system four circuit	M2IPS-104 4ZIP
FireChase CNC Detection and Actuation System	M2IPS-107 CNC FDDP
Thermal activation device T-start-45C	M2IPS-302 T-45
Thermal activation device T-start-72C	M2IPS-303 T-72
Thermal activation device T-start-110C	M2IPS-304 T-110
Activation device T-start Manual	M2IPS-305 T-man
Detection Circuit Junction Box for T-start	M2IPS-306 DCJB
Protective Cup	M2IPS-307 P CUP
High Lithium Power Accelerator For T-start With Isolation Switch	M2IPS-308 HL-PAWIS

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Description	Part num.
Solid Electrolyte Power Accelerator For T-start With Isolation Switch	M2IPS-309 SEP-PAWIS
Back up Rechargeable Power Accelerator For T-start With Isolation Switch	M2IPS-310 BUR-PAWIS
Thermal activation device TAD-45	M2IPS-TAD-45
Thermal activation device TAD-72	M2IPS-TAD-72
Thermal activation device TAD-110	M2IPS-TAD-110
Activation device TAD-Manual	M2IPS-TAD-man
Sign Illuminated with Sounder EVAC	M2IPS-513SIWS-EVAC
Sign Illuminated with Sounder DNE	M2IPS-514SIWS-DNE
Dual-Output Booster (fully monitored) to increase number of connected canisters or use high current output for ancillaries up to 5Amp	M2IPS-201 DOB2
Junction Box for Monitoring 1 Discharge Line (metal case for industrial panel)	M2IPS-202 JB-1IN
Junction Box for Monitoring 2(3) Discharge Lines (plastic case for marine & automotive applications)	M2IPS-203 JB-2/3 MA
Junction Box for Monitoring 4(5) Discharge Lines (plastic case for marine & automotive applications)	M2IPS-204 JB-4/5 MA
Flush-mounting Plate for Detection and Activation System	M2IPS-205 FMP CP 101-4
Igniter Interface Unit (IIU) to monitor Discharge line through SFM (1 IIU per canister)	M2IPS-206 IIU
Supervision Firing Module (SFM) - universal interface to monitor & discharge (up to 10) canisters by any type of Detection and Activation Systems	M2IPS-207 SFM
Junction Box for Monitoring 2(3) Discharge Lines (aluminium casting case suitable for aggressive environment in marine & automotive applications)	M2IPS-208 ALJB-2/3 MA
Junction Box for Monitoring 4(5) Discharge Lines (aluminium casting case suitable for aggressive environment in marine & automotive applications)	M2IPS-209 ALJB-4/5 MA
Pyrogen™, User's Information, Design, Operation & Maintenance Manual, Impulse Powder Fire Extinguishing Modules "IPEX", Revision num. 1.2, Issued August 2007.	M2IPS-D2007-0101
Vector Nozzle	M2IPSVEN
Straight Nozzle	M2IPSSTN
Cone Nozzle	M2IPSCON
Flat Nozzle	M2IPSFLN

Classifications:

Suitable for fire:

- Class A - combustible solids
- Class B - flammable liquids
- Class C - flammable gases
- Class E - electrically energised fires

Handling and transport: In accordance with the requirements for goods classification as U.N. num. 3178 Dangerous Goods Class 4.1, Category C, Hazchem Code 1[T]