

# SmartShelter Room

## Technical Description

Version 1.1 Jul. 2017



<b>Introduction to SmartShelter Solution.....</b>	<b>3</b>
Main technical advantages .....	3
Standards .....	3
Applications .....	4
<b>SmartShelter Room .....</b>	<b>5</b>
Self-standing wall panels .....	5
Self-standing ceiling panels .....	5
SmartShelter Room access doors .....	6
SmartShelter Room Supporting Structure.....	8
<b>Technical specification .....</b>	<b>8</b>
<b>SmartShelter Room Accessories .....</b>	<b>10</b>
Cable Gland.....	10
Air Renovation .....	11
Fire Damper.....	12
Overpressure Valve .....	13
<b>Project Management, quality control and hand-over documentation .....</b>	<b>14</b>
Project Management.....	14
Quality Control.....	14
Documentation.....	14

---

## Introduction to SmartShelter Solution

### Main technical advantages

The SmartShelter Room is a highly secure IT room that has the following advantages:

- Complete, secure technical room solution
- Modular and configurable
- High security benefits
- Easy to install and expand
- Structure and panels can be reused again if the room is relocated
- Clean expansions
- Fire resistance
- Better energy efficiency due to the high thermal insulation
- Simplicity of the project development
- Short delivery time
- Can be designed and adapted to any room shape and size.
- Can be installed by any qualified partner
- Does not require supervision of a Project Director from Schneider Electric

### Standards

SmartShelter has been designed per the most demanding standards. Its components, assembly process, and quality control are executed per the most demanding international processes and standards (IEC, EN, ISO, DIN, etc).



## Applications

The SmartShelter Room allows for a high degree of flexibility in its applications:

- Corporative data processes centers
- Business disaster recovery centers
- Operating rooms
- Critical rooms of the processes industry (dispatching)
- Healthcare records
- Banks, insurance companies, transport companies, etc

## SmartShelter Room

The enclosure walls will be comprised of self-standing panels, whose features will be detailed below.

The joints between each of the panels will be dovetailed and sealed with silicone which provides a high-level of protection from dust and water intrusion.

### Self-standing wall panels

Fire-rated wall panels will be installed vertically and is made of several layers of different materials. The outer layers will be protected by two layers of galvanized and lacquered steel sheets. The inner layer is a fire rated material which provides thermal insulation. The panels will support energy efficiency in high/low ambient temperatures. Also, this wall construction provides a systems to prevent water intrusion.

Since the panels area re-usable, any room extension or relocation will be simple, fast, and more cost effective by not having to construct a brand-new enclosure. Additionally, the panels provide clean working conditions without dust or civil works which can delay the construction because of permits request, etc.

Wall panels have the following specifications:

Use	Thickness (mm / in)	Height (mm)	Weight (kg/m <sup>2</sup> / lb/ft <sup>2</sup> )	Fire Protection	Acoustic Isolation (dB)
WALL	100 / 3.9	Variable	20,3 / 4.16	EI 120 (EN 13501-2 / EN 1363-1)	32,5

### Self-standing ceiling panels

The ceiling panels will be installed horizontally and will be constructed from the same layered material as the wall panels which are fire-rated and watertight.

Ceiling panels have following specifications:

Use	Thickness (mm / in)	Width (mm / ft)	Height (mm / ft)	Weight (kg/m <sup>2</sup> / lb/ft <sup>2</sup> )	Fire Protection	Acoustic Isolation (dB)
CEILING	100 / 3.9	1150 / 3.8	3500 / 11.5	20,3 / 4.16	EI 120 (EN 13501-2 / EN 1363-1)	32,5

### SmartShelter Room access doors

SmartShelter Room access doors provide 120 minutes of fire protection, as per EN 13501-2/EN 1363-1, and have following features:

- Single door internal dimensions are 1,1 x 2,2 meters (3.6 x 7.2 ft)
- Doors are provided with a fire-rated key security lock.
- Internal ant-panic bar will provide an emergency exit from inside the room
- Automatic closing door system is provided (not motorized)
- Closing system with electric lock embedded in the door
- Access control system (optional)

Type of Door	Sheets	Galvanized Frame (mm / in)	Width (mm / ft)	Height (mm / ft)	Fire Protection
Simple	1	150 / 5.9 elevation	1100 / 3.6	2200 / 7.2	EI120
Double	2	150 / 5.9 elevation	1600 / 5.9	2200 / 7.2	EI120



Door components included:

- Mechanical lock
- Cylinder of master keys. Cylinder lock with European profile. BMH 1013 PZW



- Electric lock (optional)
- Power supply unit for electric lock (Optional)
  - Input voltage: AC 100-240 V 50-60 Hz
  - Output power 2.0 A
  - Design to adapt the electric lock power supply to any control access system (potential-free contact or strike)
  - Two signals system to coordinate with internal push button or pass-back.
- Anti-panic bar
  - CE marked per Construction Products Directive 89/106/CEE issued by ICIM.
  - ICIM certificate per the standard UNE EN 1125



- Automatic door closing.
  - Variable closing force EN 2-6
  - Adjustable closing speed



- Intumescent door gasket

There are other door options that will provide anti-vandalism in addition the standard door features listed above. The following is a list of the anti-vandalism and fire-rating combinations available:

- RC3 and EI60
- RC4 and EI60
- RC3 and EI120

### SmartShelter Room Supporting Structure

An internal steel structure to the room will be used to support the roof and wall panels. This structure is called main structure. Based on the length of the room, there are different structural designs.

A secondary structure is also provided to hang all the overhead equipment and all the installations required for the Data Center operation. This structure is used to install fire-extinguishing piping, trays for electrical cabling, data cabling trays and other heavy equipment, as could be overhead cooling units. Finite Element Analysis (FEA) models have been analyzed to guarantee a secure and safe solution.

The structure and panels have been designed to support 150kg/m<sup>2</sup>, enough to withstand a person standing on the roof with a set of tools.

### Technical specification

General Design	
Design in accordance with TIA 942	Included
Design in accordance with IBC 2015	Included
Fire protection	
Wall and ceiling testing EI 120 as per EN 13501-2/EN 1363-1	Included
Wall and ceiling testing 60 minutes as per UL 263/ASTM E119	Optional
Door testing EI 120 as per EN 13501-2/EN 1363-1	Included
Fire performing A2-s1, d0 as system testing to EN-13501-1	Included
Support of electrical works in accordance with NEC 2017 from NFPA	Included
Break-in Protection	
System testing break-in resistance RC2 in accordance with EN 1627/1630	Included
System testing break-in resistance RC3 in accordance with EN 1627/1630	Optional
System testing break-in resistance RC4 in accordance with EN 1627/1630	Optional
Dust and Water protection	
Dust IP 5x as system testing to EN 60529 and NEMA 250	Included
Water IP x6 as system testing to IEC 60529 and NEMA 250	Included
Environmental protection	
Noise	32,5 dB(A)
Thermal Insulation	0,37 W/K*m <sup>2</sup>
EMC - Electromagnetic emissions and noise immunity	EN 61000-4-3



External Temperatures range (Panels)	From -183°C up to 1.000°C
<b>Structure</b>	
FEA structural analysis validation	Included
Structural requirements in accordance with IBC 2015	Included
CE marked in accordance with standard EN-14509	Included
External roof load capacity	150 kg/m <sup>2</sup> / 30 lb/ft <sup>2</sup>
Structure - Average linear load capacity	575 kg/m / 386 lb/ft
Single leaf door dimension (H x W)	2200 x 1100mm / 7.2 x 3.6ft
Double leaf door dimension (H x W)	2200 x 1800mm / 7.2x 5.9ft

---

## SmartShelter Room Accessories

### Cable Gland

The cable and tube entry system provides effective fire and water protection. The cable gland can easily be configured for the number and size of cables and tubes that will enter the room. It is an expandable system which allows for future room modifications.

The cable gland is composed of a steel frame and modules with practicable diameters depending on cable or piping diameters. It is fitted on each side of the enclosure's wall structure using an inner frame and outer frame, both made of galvanized steel. The sealing is achieved by adaptable modules and a compression unit.

These adaptable modules provide multidiameter technology with removable layers to perfectly adapt to a cable or a pipe. There are several modules that allows different diameters for cables and pipes 3.0 - 9.0 mm (0.118" - 3.898"). Also, unused modules function as spare locations for additional cables and pipes.



- Cable gland and the wall panel enclosure shall provide a minimum protection of 20dB against external or environmental electromagnetic fields per European standard EN 61000-4-3.
- Cable gland and wall panel enclosure shall provide a minimum isolation of 31dB inside a range between 100 Hz and 4 kHz.
- Cable glands shall provide high protection to the room against water per IP67 level of European standard EN 60529. A proven test with the according certified documentation shall be provided by an international accredited certification company.
  - All installed materials shall be non-combustible per levels established by ISO 1182 standard.
  - Cable gland and room shall be designed per TIA-942 standard.



External dimension	For cable/pipe ø		Number of cables/pipes
	(mm)	(in)	
15x15 mm	3 ~ 11	0.1 ~ 0.4	1
15x40 mm	3 ~ 11	0.1 ~ 0.4	3
20x20 mm	4 ~ 15	0.2 ~ 0.6	1
20x40 mm	4 ~ 17	0.2 ~ 0.7	2
30x30 mm	10 ~ 25	0.4 ~ 1.0	1
40x40 mm	22 ~ 35	0.8 ~ 1.4	1
60x60 mm	28 ~ 54	1.1 ~ 2.1	1
90x90 mm	48 ~ 71	1.9 ~ 2.8	1
120x120 mm	68 ~ 99	2.7 ~ 3.9	1



The SmartShelter Room allows for alternative gland/sealing systems depending on specific requirements in each case, like high density of data cabling, HVAC piping, etc.

### Air Renovation

Air renovation of the room will be maintained by a system of forced air. An industrial fan will draw the air from outside the room. An overpressure valve will reduce pressure when it exceeds certain levels. And a fire damper will be used to comply with the necessary protection specifications.

To avoid the entry of objects and/or particles, an external protection grill and a particle filter - G3 type - will be provided with the air renovation system.

Additionally, the air renovation system can be supplied with a timer to define the number of air renovations per hour or day.

AIR RENOVATION SYSTEM (ARS)		
UNIT GENERAL DATA		ARS (CE version)
AIR CIRCUIT DATA		
Number of fans / type		1 / Centrifugal
Nominal airflow <sup>(1)</sup>	m <sup>3</sup> /h (cfm)	75 44
External static pressure	Pa (in wg)	50 0,20
AIR FILTERING		
Filtration: Primary / secondary / fine <sup>(2)</sup>	EN 779 ASHRAE 52.2	G4 / F7 / F9 MERV8 / MERV13 / MERV16
ELECTRICAL DATA		
Electrical heater	kW	3
Power consumption: Standard / with heater	W (hp)	27 / 3.027 0,04 / 4,06
Power supply		230V / 1Ph / 50-60Hz
PHYSICAL DATA		
Width	mm (in)	450 17,7
Depth	mm (in)	450 17,7
Height	mm (in)	1300 51,2
Weight	kg (lb)	75 165

(1): Other airflows under request

(2): Fine filtration optional. F7 filter is replaced by the F9.



## Fire Damper

For Data Centers where the cooling equipment is outside of the IT room, it is necessary to install fire dampers to avoid the fire extinguishing gas leaking through the cooling equipment. A damper will be installed on the SmartShelter Room enclosure and it will be activated by the fire protection system signal which communicates with damper actuator/motor.

Fire damper will provide the same protection features as the SmartShelter Room panels, like fire resistance. Technical features of the fire damper are:

- Galvanized steel
- It can be installed in walls and ceilings
- Several options for activation system:
  - Relay
  - Automated motor

- Completely integrated to the SmartShelter Room, the fire dampers will have same look and finish as other cabling and mechanisms.



### Overpressure Valve

The fire protection system will be designed to detect and extinguish fires inside of the rooms. This automatic system will be safe for people and equipment. It will include a fire panel for release control and provide a conventional fire detection, ASD (Aspirating Smoke Detection) and a clean agent extinguishing system.

All clean gas systems must have Over Pressure Vents fitted to protect the room from damage during gas release. The room needs to be able to release the overpressure to protect the walls, ceilings and doors from any damage. The gas releases over a period of a minute and starts immediately to build up a positive pressure within the room, the overpressure valves allow gas to dissipate through the specially weighted blades so that no interconnection between the fire detection and suppression system is necessary. While in the case of Inert Gas (300bar) we discharge around 40% more gas into the room than was originally, in the case of NOVEC 1230 (30bar) less gas is needed. Consequently, overpressure valves will be dimensioned depending on the extinguishing gas utilized.



---

## Project Management, quality control and hand-over documentation

### Project Management

Project Management is done by an assigned Project Manager (PM) specialist. The PM is responsible for:

- All components sourcing and deliveries per the customer's order.
- Transportation and unloading coordination at customer's site. (\*)
- Installers' coordination. (\*)
- Installation schedule and planning. (\*)
- Installation supervision and on-site coordination. (\*)
- Quality control and stress-check tests. (\*)
- Finishing observations and corrections. (\*)
- Issue of Quality Certificate.

(\*) Depending on the agreed upon Statement of Work (SOW)

Each project is planned individually and all information on schedules and time is shared and briefed to the installers.

### Quality Control

Quality Control is verified by the PM as per the following tests:

- Visual inspection of all components. (\*)
- Close follow-up during installation. (\*)
- Stress-check functional test of each component as per previously defined test procedure for each equipment or system. (\*)
- Site and customer area cleaning ready for Smart Shelter+ delivery. (\*)

(\*) Depending on the agreed upon Statement of Work (SOW)

### Documentation

We deliver the following documents at the end of the project:

- Drawings
- Instructions and warranty
- Certificates