![Titus logo]

**Product Bulletin**





## Overview

The FMS-2000C Critical Environment Controller ensures laboratory and healthcare settings are safe for all occupants by continuously verifying room pressure and airflow. The FMS-2000C can precisely control and monitor six parameters, which includes differential pressure, temperature, humidity, $CO_2$ levels, airflow, and air changes per hour. One controller can control or monitor up to four spaces simultaneously for any of the six parameters. This controller has a displayed pressure resolution down to 0.0001 in. W.C. or 0.0249 Pa and instantly updates as conditions change.

The FMS-2000C provides maximum room status awareness with color coded visual alarms both on screen and with the 360° Safety Halo illuminated edge. When the 360° Safety Halo is enabled, staff can easily monitor spaces on long corridors. You can put the audible alarm into snooze mode with one tap to the screen. There are two password protected access levels, one for administrators and one for restricted level users, such as nurses.
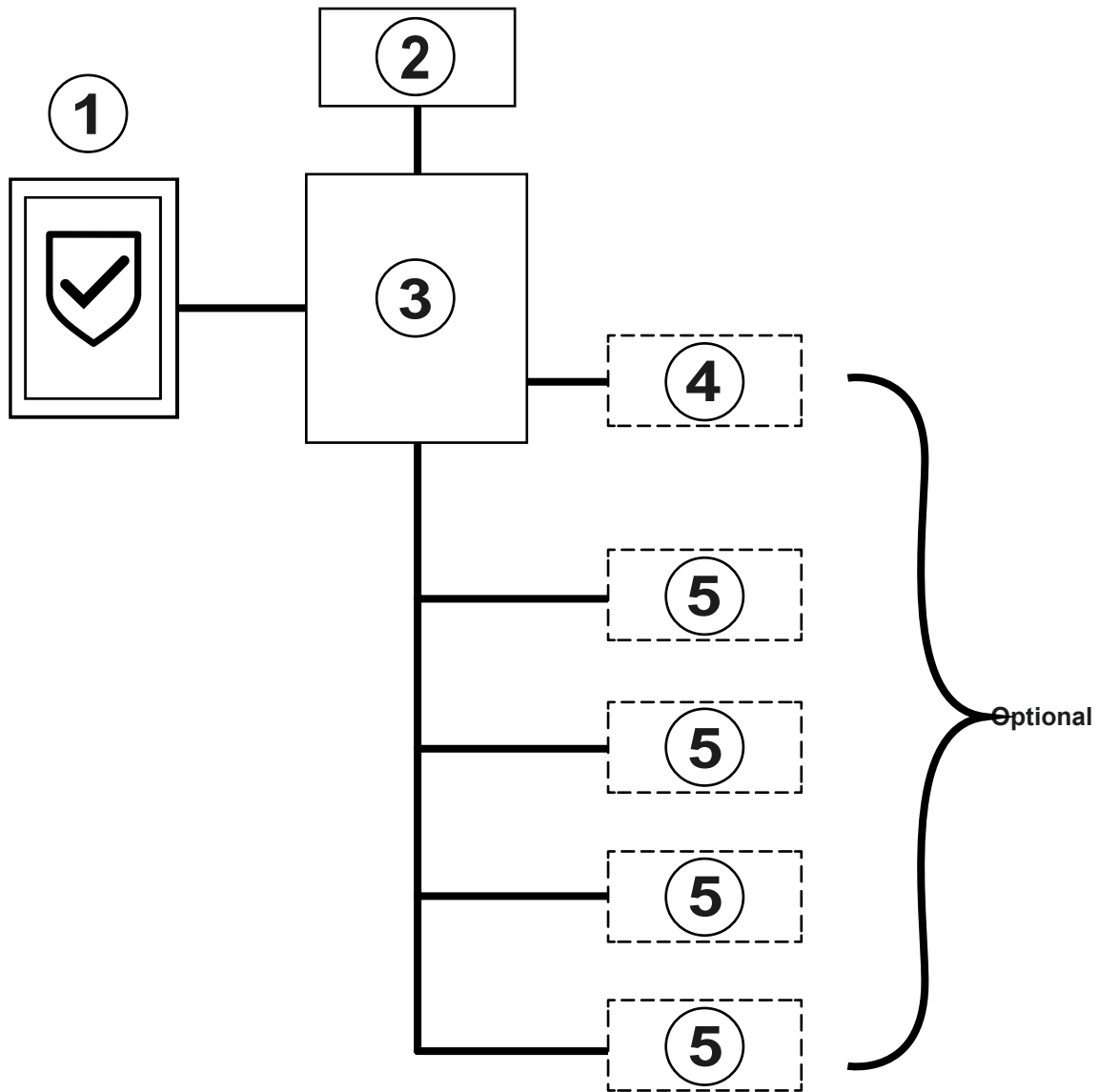
## Features and benefits

Table 1: Features and benefits

| Features | Benefits |
|---|---|
| Parameters | Controls and monitors up to six parameters across four rooms |
| Connectivity | 18 available Input/Output (I/O) resources |
| Communications protocol | BACnet® MS/TP |
| Lighting | 360° Safety Halo illuminated edge helps staff monitor spaces down long corridors |
| Design | Intuitive user interface allows for fast and easy set up |
| Display | 5 in. (127 mm) high definition 720 pixels by 1280 pixels touchscreen display that works with rubber, nitrile, and latex gloves |
| Non-volatile memory | Saves users settings in case of a power outage |
| Password protection | Two access levels to prevent unauthorized access |
| Energy savings | Unoccupied mode reduces air and temperature changes |
| Home screen  customization | The user can define the parameters displayed |
| Display override | Display measured values from the other monitored devices within the building automation system (BAS) |
| Global release | Offers a user interface that is translated into 17 languages |

## Components

Figure 1: Components overview



**Note:** Purchase of the FMS-2000C includes the display, controller, and from 0-4 pressure sensors. For more information, see Ordering information.

Table 2: FMS-2000C System diagram

| Item | Component |
|------|-----------|
| 1 | FMS-2000 Display |
| 2 | Power supply |
| 3 | Controller |
| 4 | Door switch |
| 5 | Remote sensor |

# Applications

The following are appropriate environments for the FMS-2000C:

- Airborne infection isolation (AII) rooms - negative pressure
- Protective environments (PE) isolation rooms - positive pressure
- AII and PE rooms with an anteroom
- Operating rooms (ORs)
- Compounding pharmacies
- Pandemic preparedness rooms
- Intensive care units
- Laboratories and vivariums
- Burn units
- Bronchoscopy suites
- Mortuary preparation rooms and autopsy rooms
- Data centers
- Laundry areas
- Indoor growing facilities
- Crime labs

See Table 3: Product guide to help you determine whether your application requires the FMS-2000C Critical Environment Controller or the FMS-2000M Critical Environment Monitor.

Table 3: Product guide

| Features and capabilities | FMS-2000C | FMS-2000M |
|---|---|---|
| Differential pressure control | Yes | No |
| Differential pressure monitoring | Yes | Yes |
| Volumetric air flow | Yes | Yes[1] |
| Volumetric offset control | Yes | No |
| Temperature control | Yes | No |
| Temperature monitoring | Yes | Yes[1] |
| External thermostat integration | Yes | No |
| Relative humidity | Yes | Yes[1] |
| Air change rate | Yes | Yes[1] |
| $CO_2$ concentration | Yes | Yes[1] |
| BACnet MS/TP communications | Yes | Yes |
| Metasys N2 communications | No | No |
| Lon communications | No | No |
| Door switch support | Yes | Yes |
| Occupancy switch support | Yes | No |
| Override switch support | Yes | No |
| Analog input override | Yes | No |
| Analog output override | Yes | No |
| Universal analog inputs | 4 | 0 |
| Universal analog outputs | 4 | 0 |
| Digital inputs | 4 | 4[2] |
| Relay outputs | 4 | 0 |
| Thermistor inputs | 2 | 0 |
| Works with CMS-1655 and CMS-2000 Central Monitoring Station | Yes | No |

[1] Shared through BACnet by writing to the appropriate AV.

[2] Up to four digital inputs. One input on each pressure sensor. For door switch use only.

# Ordering information

Table 4: Ordering information

| Features | Code letter or number and description | Product code number example: FMS2C-BT20 |
|---|---|---|
| Unit | FMS = Flow Monitor Station (FMS) | FMS |
| Series | 2 = 2000<br>C = Controller | 2C |
| Communications protocol | B = BACnet MS/TP | B |
| Mounting style | T = Thin | T |
| Remote sensor[1] | 0 = No remote sensors<br>1 = One remote sensor<br>2 = Two remote sensors<br>3 = Three remote sensors<br>4 = Four remote sensors | 2 |
| ISO power | 0 = 24 V power supply not included | 0 |

[1] If you plan to use third-party sensors, select 0.

## Mounting hardware

All FMS-2000 Thin mount displays require one of the following mounting options for installation:

Table 5: Mounting hardware

| Ordering code | Description | Dimensions (H X W X D) |
|---|---|---|
| RFINMT-2 | Rough in Box for new construction where walls are not installed | 4.84 in. x 3.18 in. x 1.5 in.<br>(122.94 mm x 80.77 mm x 38.1 mm) |
| RTROMT-2 | Retrofit Ring with walls already installed | 6.06 in x 4.311 in. x 0.548 in.<br>(153.924 mm x 109.499 mm x 13.919 mm) |

## Available transformers

The following table lists the transformers that meet the requirements for the FMS-2000C Critical Environment Controller.

Table 6: Y65T and Y63T transformers

| Ordering code | Primary voltage (VAC) | Secondary voltage (VAC) | Primary connection | Secondary Connection | Mounting | Agency requirement |
|---|---|---|---|---|---|---|
| Y65T31-0 | 120/208/240 | 24 | Male fitting 8 in. primary leads | Three screw terminals (one is blind) | Foot 4 in. x 4 in. plate | cULus Class 2 |
| Y65T31-0G | 120/208/240 | 24 | Male fitting 8 in. primary leads | Three screw terminals (one is blind) | Foot 4 in. x 4 in. plate | cULus Class 2 |
| Y65T42-0 | 120/208/240 | 24 | Common male fitting 8 in. primary leads | Common male fitting 8 in. secondary leads | Hub 4 in. x 4 in. plate | cULus Class 2 |
| Y65T54-0 | 120/208/240 | 24 | 8 in. primary leads | 8 in. secondary leads | Foot-skeleton | cULus Class 2 |
| Y63T22-0 | 120/208/240 | 24 | End bell hole 8 in. primary leads | End bell hole 8 in. secondary leads | 4 in. x 4 in. | cULus Class 2 |

**Note:** Some applications may require a plenum rated box. Do not power more than one device with a single transformer.

# Technical specifications

Table 6: Technical specifications

| Specification | Description |
|---|---|
| Intended use | Indoor use |
| Overvoltage category | II |
| Altitude | Up to 2000 m (6562 ft) |
| Pressure range | ± 0.2500 in. W.C. (± 62.27 Pa) |
| Alarm range | ± 0.2500 in. W.C. (± 62.27 Pa) |
| Display range | ± 0.2500 in. W.C. (± 62.27 Pa) |
| Accuracy | ± 0.5% full scale |
| Air flow sensor type | Digital differential pressure features no offset, zero drift and is hysteresis free |
| Flow control resolution | ± 0.0010 in. W.C. (± 0.2491 Pa) |
| Displayed pressure resolution | ± 0.0001 in. W.C. (± 0.0249 Pa) |
| Control capability | Up to 4 independent spaces |
| I/O Resources | 4 universal inputs (0 mA – 20 mA, 4 mA – 20 mA, 0 VDC – 5 VDC, 0 VDC – 10 VDC, 1 VDC – 5 VDC, 2 VDC – 10 VDC)<br>2 thermistor inputs (NTC Type 2 or 3, 10K at 77° F)<br>4 digital inputs (active-high or active-low)<br>4 universal outputs (0 mA – 20 mA, 4 mA – 20 mA, 0 VDC – 5 VDC, 0 VDC – 10 VDC, 1 VDC – 5 VDC, 2 VDC – 10 VDC)<br>4 relay outputs (NO or NC contacts 1A at 24 VDC) |
| Operating temperature | 32°F to 104°F (0°C to 40°C) |
| Operating humidity | 10% to 95% relative humidity, non-condensing |
| Mounting | Thin mount for shallow wall cavities |
| Alarm indication | Safety Halo color coded visual, audible alarm |
| Alarm silence | Touchscreen, auto-reset |
| Password protection | Up to 50 user passwords with 2 access levels (administrator and restricted) |
| Communications protocol | BACnet® MS/TP (to BAS) 76.8k, 38.4k, 19.2k, 9600 baud |
| Power requirement | 24 VAC (nominal, 21.6 VAC minimum/26.4 VAC maximum), 50/60 Hz 30 VA power supply, Class 2, Limited Energy, LPS or minimum power 30 VA transformer. |
| Power consumption | 30 VA maximum |
| Pollution degree | 2 |
| Display resolution | 720 pixels x 1280 pixels |
| Pluggable screw terminal blocks | 18 AWG to 22 AWG (1.0 mm to 0.6 mm diameter) |
| Display dimensions (height x width x depth) | 5.3 in. x 3.5 in. x 1.17 in. (134.62 mm x 88.9 mm x 29.72 mm) |
| Mounted depth | 0.58 in. (14.73 mm) |
| Controller dimensions (height x width x depth) | 6.56 in. x 5.5 in. x 1.88 in. (166.62 mm x 139.7 mm x 47.75 mm) |

| Compliance | United States | UL Listed (E515759) to UL 61010-1; FCC 47CFR Part 15; BTL Listed (BTL-30774) |
|---|---|---|
| | Canada | cUL Listed (E515759) to CAN/CSA C22.2 NO. 61010-1; ICES-003 |
| | Europe (CE) | Low Voltage Directive [2014/35/EU] per EN 61010-1<br>EMC Directive [2014/30/EU] per EN 61326-1 + EN 55011 |
| | United Kingdom (UKCA) | Electrical Equipment (Safety) Regulations per EN 61010-1<br>EMC Regulations per EN 61326-1 + EN 55011 |
| | International Standards | Product fulfills the requirements of IEC 61010-1 as recognized by national or regional authorities. |
| | BACnet International (BTL) | BACnet Testing Laboratories (BTL) 135-2021 Listed BACnet Application Specific Controller (B-ASC) |

# North American Emissions Compliance

## United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case users will be required to correct the interference at their own expense.

## Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

# Repair information

If you purchased a service agreement, contact your Titus representative for a replacement unit. If you do not have a service agreement, contact tu@titus-hvac.com.

# Patents

Patents: https://jcipat.com

# Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information and other terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

# Product warranty

This product is covered by a limited warranty. Contact your representative for more details.

# Contact information

Contact your local Titus representitive

Contact Support: Call (+1) 972-212-4800 or email tu@titus-hvac.com