# ZOOM System

## ZOOM Monitoring Cabinet 45U

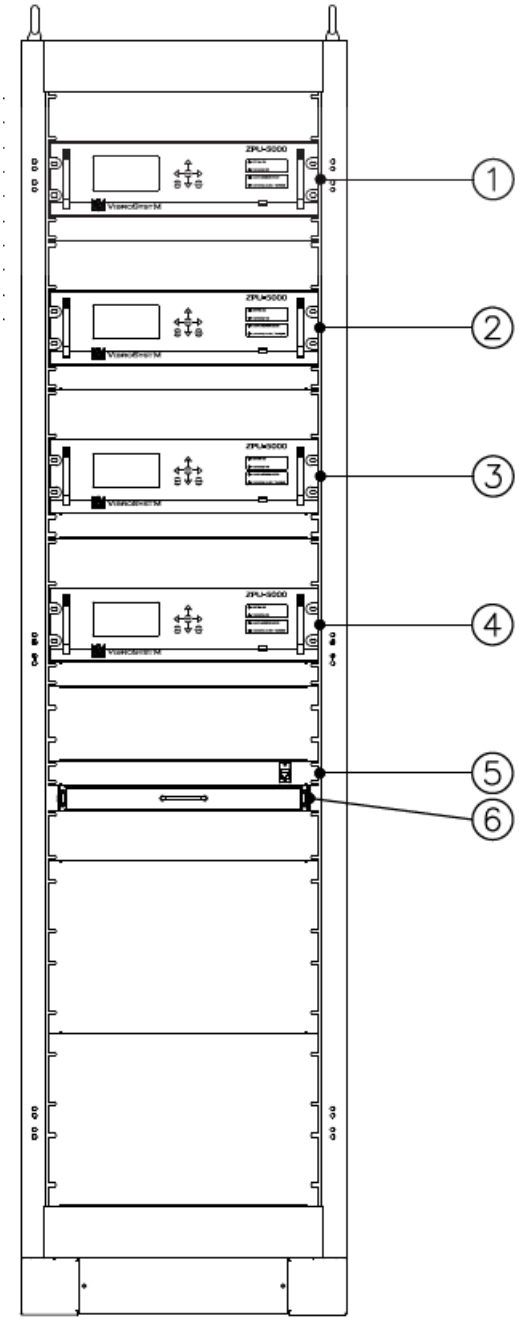
### Main Features

- For up to four acquisition units
- High quality components from suppliers with proven reliability
- Pre-assembled cabinets allow for fast and easy on-site installation, while minimizing the risk of error
- Pre-wired with high quality wiring, structured cabling by qualified personnel, fully tested
- Factory Acceptance Test (FAT) report provided, performed with client present on request
- Compatible with fiber-optic and traditional copper cable local area network
- Terminal block panels are included for easy connection of measuring chains and optional signals
- Relay panels driven directly by the acquisition units are available in various configurations for alarm annunciation
- Optional redundant 24Vdc power output for measuring chains, network switch, and relays
- User Manual included, showing components location and general configuration

# Equipment Location Overview

This overview shows the general layout of the equipment and components inside the monitoring cabinet.

## Front view (typical 45U)

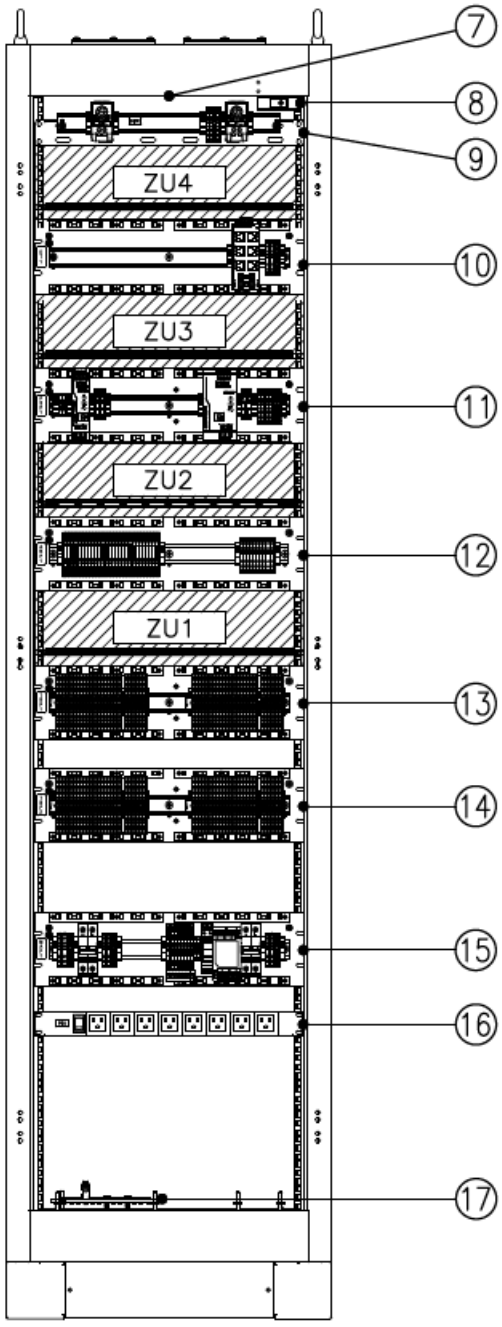



The front of the cabinet provides access to the instruments, and allows connection of a portable computer. A key-lock door (not shown) with a full height window protects the components against dust and unauthorized access, yet still allows a view on the instrument displays.

| ITEM | DESCRIPTION |
|---|---|
| 1 | Equipment #4 - ZPU-5000 |
| 2 | Equipment #3 - ZPU-5000 |
| 3 | Equipment # 2 - ZPU-5000 |
| 4 | Equipment #1 - ZPU-5000 |
| 5 | RJ-45 panel |
| 6 | Sliding shelf |

45U cabinet: Up to 4 acquisition units can be installed.

## Rear view (typical 45U)




Each cabinet includes standard components installed directly in the cabinet or grouped on panels, with interconnections provided by means of wires and standardized cable harnesses.

The back of the cabinet provides access to the terminal blocks for connection of power, sensor input signals, alarm output signals, Ethernet network, and other I/O signals. A key-lock solid metal door (not shown) protects the components against dust and unauthorized access.

The rear door includes a fan with filter (bottom) and a louver (top) to provide ventilation.

| ITEM | DESCRIPTION |
|---|---|
| 7 | Light fixture |
| 8 | Door switch |
| 9 | Door fan rail with two thermostats |
| 10 | Ethernet network panel |
| 11 | Low voltage supply panel |
| 12 | Alarm relay panel |
| 13 | Terminal block panel 1 |
| 14 | Terminal block panel 2 |
| 15 | Main & auxiliary power panel |
| 16 | Multi-outlet bar |
| 17 | Grounding bar and protective conductor terminal |

# Specifications - Rack Enclosure

## PHYSICAL CHARACTERISTICS

- Dimensions (including plinth base and padlock handles, without the removable lifting eye bolts)
  - Height: 2283 mm *[90.13 in.]*
  - Width: 584 mm *[23.0 in.]*
  - Depth
    - with handles: 914 mm *[36.7 in.]*
    - without handles: 852 mm *[33.53 in.]*
- Material
  - Frame, front door, rear door, and gland plates: Steel, 1.9 mm *[14 AWG, 75 mils]*
  - Side panels (removable), and mounting plates: Steel, 1.5 mm *[16 AWG, 60 mils]*
- Corrosion protection: Phosphate coating foundation
- Paint coating
  - Type: Textured recoatable powder coating
  - Color: ANSI/ASA 61 grey
  - Thickness (minimum): 38 µm
  - Plinth base: Same color as cabinet
- Front door: Steel frame with clear polycarbonate view window, padlock key handle
- Rear door: Solid steel rear door with intake and exhaust grille, and padlock key handle
- Sliding shelf: Standard, located under the Ethernet panel, provides a working surface on the front of the cabinet for a laptop or portable instrument
- Maximum weight (approximative)
  - 45U with four ZPU-5000 units [12 kg *(26 lb)* each]): 340 kg *[750 lb]*
- Anchoring provided (optional use): Using concrete anchors through plinth base, seismic heavy-duty bolt anchor, M8, 20 mm thickness, HSL-3 M//20
- Lighting: 5W LED fixture, controlled by a door switch activated by the rear door
- Vertical cable conduits: 2 dedicated to internal wiring, 2 dedicated to external wiring from field

## ENVIRONMENT

- Protection rating: IP54, NEMA 12
- Temperature range
  - Operating: 0 to 40 °C *[32 to 104 °F]*
  - Storage: -20 to 80 °C *[-4 to 176 °F]*
- Humidity: Up to 95%, non-condensing
- Ventilation
  - Intake: Fan, bottom of rear door, controlled by thermostat and door switch
  - Exhaust: Louver, top of rear door
  - Thermostat 1 - Fan control: Adjustable setting
  - Thermostat 2 - High temperature alarm: Adjustable setting, relay available for remote annunciation
- Heating (optional)

  A heater with fan, thermostat and hygrostat can be added to control the internal temperature and minimize condensation.
  - Option A: 200 W, 110-120 Vac [50/60 Hz]
  - Option B: 200 W, 230 Vac [50/60 Hz]

## CONNECTION

- Cable entry
  - Top: Two gland plates

| | |
|---|---|
| Bottom | Single gland plate |
| • Connection method | |
| Power input | Refer to Power Input Panel |
| Alarm relays | Refer to Alarm Relay Panel |
| Sensors, optional connections, RS-485/422 network | Refer to Terminal Block Panel |
| • Grounding | |
| Grounding bar | fixed to bottom of frame |
| Dimensions | 19 x 6.4 x 200 mm *[0.75 x 0.24 x 7.87 in.]* |
| Material | Plated copper |
| Connection method | Ring terminal screwed into a tapped hole |
| Protective conductor terminal | |
| Material | Copper |
| Conductor cross-section | 33.6 to 8.37 $mm^2$ *[2 to 8 AWG]* |

## Power Input Panel

Each cabinet receives power from two sources to support two distinct power input circuits: Main and Auxiliary

### Main Power Input Circuit

The main power circuit is distributed through pull-out switches to the main components of the monitoring system: the acquisition units, and the low voltage power supplies (24 Vdc) for measuring chains C accessories.

| | |
|---|---|
| • Main input voltage range | 100 to 240 Vac [50/60 Hz], or 120 to 250 Vdc |
| • Connection | |
| Terminal block types | Screw terminal, grey (power input), and green/yellow (ground) |
| Conductor cross-section | |
| Solid conductor | 0.2 to 4 $mm^2$ *[22 to 10 AWG]* |
| Flexible (terminated with ferrule) | 0.2 to 4 $mm^2$ *[22 to 10 AWG]* |
| • Load (max.) | 665 W |
| • Protection | |
| Supplementary protective device (External listed circuit breaker required) | 10 A |
| Surge protection device | Included (standard) |
| EMI filter | Included (standard) |

### Auxiliary Power Input Circuit

The auxiliary power circuit provides power to the auxiliary components inside the monitoring cabinet: the door fan, the lighting fixture, and the multi-outlet power bar.

| | |
|---|---|
| • Auxiliary input options: | |
| Option A | 110 to 130 Vac [50/60 Hz] |
| Option B | 200 to 240 Vac [50/60 Hz] |
| • Connection | |
| Terminal block types | Screw terminal, grey (power input), and green/yellow (ground) |
| Conductor cross-section | |
| Solid conductor | 0.2 to 4 $mm^2$ *[22 to 10 AWG]* |
| Flexible (terminated with ferrule) | 0.2 to 4 $mm^2$ *[22 to 10 AWG]* |
| • Load (max.) | |
| at 120 Vac | 1300 W |

| | |
|---|---|
| at 220 Vac | 2400 W |
| • Protection | |
| Supplementary protective device | 10 A |
| (External listed circuit breaker required) | |
| • Multi-outlet power bar | selected based on the country of destination (6, 7, or 8 outlets) |

## Low Voltage Supply Panel

Includes two (or four*) 24 Vdc power supply blocks for measuring chains and accessories. All power supplies have a LED status indicator and a dry contact, connected to the Alarm relay panel, for remote monitoring of the power supplies status.

### Electrical characteristics of the power supplies

| | |
|---|---|
| • Output | |
| Circuit 1- Measuring chains | 24 Vdc, 10 A |
| Circuit 2 - Alarm relay panel & Ethernet panel | 24 Vdc, 3.5 A |
| • Input protection | |
| Circuit 1 - Measuring chains | Fuses (2), 5x20 mm, 3.15 A slow-blow |
| Circuit 2 - Alarm relay panel & Ethernet panel | Fuses (2), 5x20 mm, 2.5 A slow-blow |

* *As an option, redundancy can be provided by the installation of secondary power supplies, connected in parallel to the same feeds (only one supply block is under load on each circuit).*

## Alarm Relay Panel

The standard Alarm relay panel included in the cabinet provides either 12 or 20 relay modules for remote annunciation of alarm signals. The first four relay modules are dedicated to specific internal monitoring tasks:

| Identification | Typical Source | Description |
|---|---|---|
| HT | Thermostat | Remote notification of an abnormally high temperature inside the cabinet |
| DC OK | Power supplies | Remote confirmation that all power supplies are operational |
| System OK | ZPU-5000 Control Module | Remote confirmation that all acquisition units are operational |
| Channels OK | ZPU-5000 Control Module | Remote confirmation that all measuring chains are operational |

The remainder 8 or 16* relays are used for alarm signals (Alert/Danger) generated by the monitoring equipment.The coils are powered by 24 Vdc, and are typically controlled by relay driver signals from acquisition unit output channels.

* *The cabinet is delivered with various mappings of pre-wired relay modules, in conformance with parameters and user needs.*

### Connection of the relay sockets

| | |
|---|---|
| • Terminal block type | Push-in, gray, 6.2 mm width |
| • Conductor cross-section | 0.14 to 2.5 $mm^2$ *[26-14 AWG]* |

### Electrical characteristics of the relays

| | |
|---|---|
| • Contact type | 1PDT |
| • Maximum switching voltage | 250 V ac/dc |
| • Minimum switching voltage | 5 V (at 100 mA) |
| • Min. switching current | 10 mA (at 12 V) |

- Maximum inrush current: 10 A (4 s)
- Limiting continuous current: 6 A
- Interrupting rating (ohmic load) max.: 140 W (at 24 Vdc), 20 W (at 48 Vdc), 18 W (at 60 Vdc), 23 W (at 110 Vdc), 40 W (at 220 Vdc) 1500 VA (for 250 Vac)

# Communication

## Ethernet panel

Each cabinet includes a 24 Vdc Ethernet switch for the connection of multiple acquisition units to VibroSystM's network. Two types of interface are provided: Ethernet RJ45, and fiber optic. Fiber optic connectors can be used for on-site connection of the Ethernet switch to the local FO network.

### Characteristics of the Ethernet switch

- Available configurations: 6 RJ45 Ports/ 2 FO ports; 10 RJ45 Ports/ 4 FO ports
- Interface specifications
  - Ethernet RJ45 interface
    - Type of connection: RJ45 socket, auto-negotiation and auto-crossing
    - Transmission physics: Ethernet in RJ45 twisted pair
    - Transmission speed: 10/100 Mbps
    - Maximum cable length: 100 m (twisted pair)
  - Fiber optic interface
    - Type of connection: SC-Duplex (FO connectors are supplied for on-site installation)
    - Transmission physics: Multimode glass fiber
    - Transmission speed: 100 Mbps (SC-D, full duplex)
    - Maximum cable length: 2 000 m (glass fiber 62.5/125)

## RJ-45 panel for local connection

The RJ-45 panel on the front of the cabinet provides a port to temporarily link a workstation to the network for local access to the ZOOM software.

# Terminal block panel

Each cabinet includes two terminal block panels, each with up to 50 multi-level terminal blocks. These interconnection terminal blocks are pre-wired to the internal instruments in the cabinet, and allow connection of the signal inputs, power supply to the sensors, and other optional connections.

- Connection
  - Terminal block type: Push-in, gray, AWG 24-10, 6.2 mm width
  - Nominal cross section: 4 mm²

## Wiring and cabling

All wires and cables have stranded tinned copper conductors, and each conductor is terminated by either a lug, or a tinned insulated ferrule.

### Single conductor wires

- Internal main and auxiliary power distribution
  14 AWG, 600 V, PVC jacket, colors: white, black, green/yellow
- Internal 24VDC power distribution
  16 AWG, 600 V, PVC jacket, colors: red, black
- Digital signal and relay control circuit
  16 AWG, 300 Vrms, PVC jacket, colors: red, black
  20 AWG, 300 Vrms, PVC jacket, colors: red, black
  22 AWG, 300 Vrms, PVC jacket, colors: red, white, green

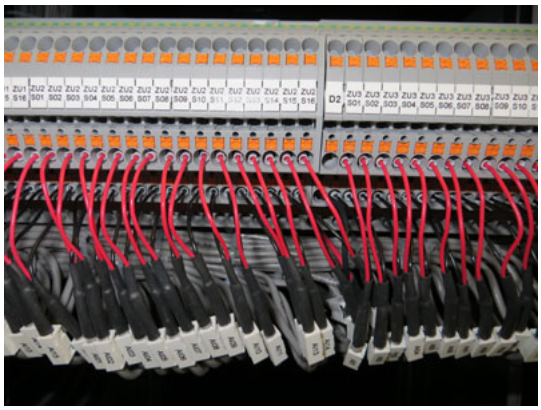
### Multiconductor cables

- Internal 24VDC power distribution
  16 AWG, stranded (19x29), 300 V, PVC jacket, 1 twisted pair, shielded, color code: red & black
- Digital signal and relay control circuit
  22 AWG, stranded (7x30), 300 V, PVC jacket, 2 twisted pairs, individually shielded, color code: red & black, green & white
- Analog Input/Output
  20 AWG, stranded (7x28), 600 V, PVC jacket, 1 pair, shielded, color code: red & black
- RS-422/485 serial communication
  24 AWG, stranded (7x32), 300 V, PVC jacket, 2 twisted pairs, color code: white/blue & blue/white, white/orange & orange/white

## Marking and labels

The structured wiring method clearly identifies each terminal block and each wire. The components inside the cabinets are connected by means of standardized harnesses.

- Multi-conductor cables inside a harness are identified with a printed cable marker, either clip-on or secured with a cable tie.
- Every control wire is identified at both ends with a printed clip-on cable marker.



- Every connection point on every terminal block is identified (on both sides) with a printed plastic marker.
- Every connector is identified with a plastified printed label.
- Every safety function grounding point on the panels and inside the cabinet is identified with a polyester laminated label.