

# MODULAR DC-TO-DC CONVERTERS

## 48-VOLT TO 24-VOLT



Model 1635-48-24-20 Converter Modules and  
Model 1635-48-24-S19 Power Shelf

### FEATURES

- **20-AMPERE PLUG-IN MODULES WITH INPUT-TO-OUTPUT ISOLATION**
- **UP TO 2 KILOWATTS IN THREE RACK SPACES (HEIGHT 5.25")**
- **EACH MODULE HAS INTEGRAL PARALLELING DIODE AND LOAD-SHARING CAPABILITY**
- **MODULES CAN BE INSERTED OR REMOVED WITHOUT SYSTEM SHUTDOWN**
- **80%-85% EFFICIENCY**
- **FRONT-PANEL AMMETER, VOLTAGE ADJUSTMENT AND STATUS INDICATORS**

This 48Vdc-to-24Vdc converter shelf/module system provides a well-regulated dc output voltage from station batteries or other widely fluctuating dc sources. This output is galvanically isolated from the source and chassis and, therefore, may be connected either as a positive or a negative output. Applications include powering radio transceivers, rf amplifiers and other critical electronic loads in wireless/wireline telecommunications equipment sites.

The front-access converter shelf occupies only 5.25" of vertical rack space in standard 19" or 23" equipment racks. Each shelf can be equipped with up to four 500-watt plug-in converter modules. A full shelf with four 24-Vdc output modules has a rated output current capacity of 80 Adc or can provide 60 Adc with n+1 redundancy.

Front-panel controls and indicators for each module include a combined input-power circuit breaker and ON/OFF switch, a green and a red LED to indicate the status of the module, an LED bar-graph ammeter for measuring output current, output-voltage test points, and a screwdriver adjustment for setting the output voltage. Contact points of an internal Form C relay are available for remote signaling of improper module output.

## SPECIFICATIONS

### Model 1635-48-24-20 Module

#### Input Voltage

42 Vdc to 58 Vdc (48 Vdc nominal)

#### Input Current

11.6 Adc (typical current at full load, nominal input and output voltages)

#### Output Voltage

24 Vdc nominal (adjustable  $\pm 5\%$ )

#### Output Current

0 to 20 Adc

#### Output-Voltage Regulation

Versus line:  $\pm 0.5\%$

Versus load:  $\pm 2.5\%$

#### Output-Voltage Ripple and Noise

10 millivolts rms, 100 millivolts peak-to-peak (typical when installed in a Model 1635 Power Shelf)

#### Efficiency

The efficiency reaches 80% at approximately 15% of full load and remains above 80% for most of the load range. The no-load input current is approximately 0.3 Adc. Heat dissipation is approximately 280 BTU/hour at full load.

#### Isolation

Mutual electrical isolation is provided between the input circuit, the output circuit, and chassis.

#### Protection

Protection against overloads and short-circuits, converter-induced output overvoltages, and cooling-fan failure is provided electronically. Recovery to normal operating conditions is automatic upon removal of the overload or short-circuit fault. Following an overvoltage or fan-failure shutdown, input power to the converter module must be removed for thirty seconds and then reapplied to resume normal operation. Protection against accidental reversal of the input-voltage polarity during installation is provided by a shunt diode working in conjunction with the module's front-panel circuit breaker.

#### Ambient Temperature Range

Operating: 0°C to +50°C  
(internal fan cooling)

Storage: -40°C to +95°C

#### Controls and Indicators

A combination circuit breaker and ON/OFF switch is provided for input power. A front-panel potentiometer is provided to adjust the output voltage of the

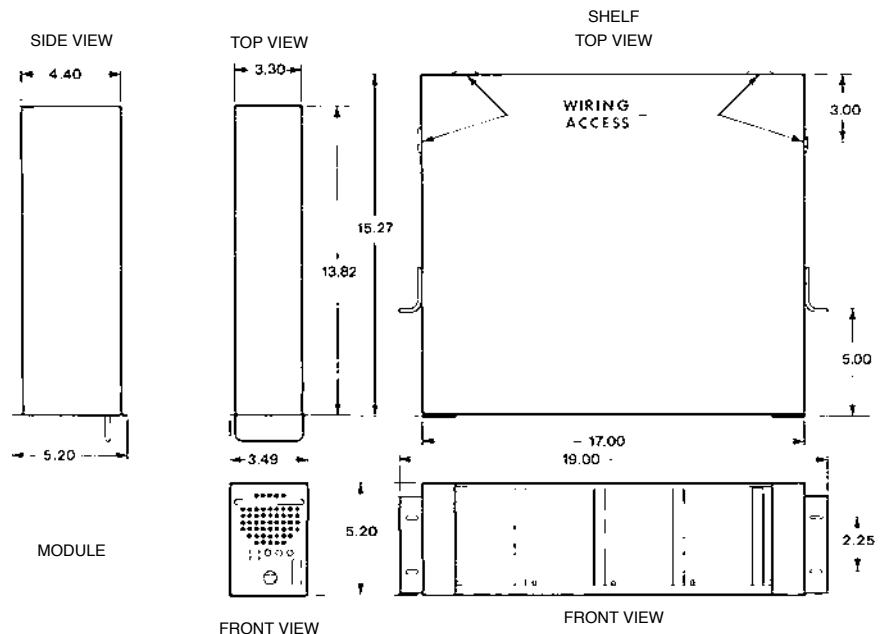


Fig. 1 Series 1635 Module/Shelf overall dimensions (inches)<sup>†</sup>

module, which can be monitored using test points adjacent to the potentiometer. The output current is displayed on a 10-segment LED bar graph. A green LED labeled "INPUT POWER" indicates that the input circuit breaker/switch is in the "ON" position and input power is present. A red LED, labeled "ALARM CONDITION", indicates that the module's output voltage is low or not present. This LED will indicate module or system alarm conditions including output overload or short circuit, input voltage too low or not present (including circuit breaker in "OFF" position), and problems within the module circuitry itself. The alarm condition of any module can be remotely signaled through a set of Form C contacts provided by each module. These contacts are rated for 0.5A at 48 Vdc and 1.0A at 24 Vdc.

## PHYSICAL CHARACTERISTICS

### Model 1635-48-24-20 Module and Model 1635-48-24-S19 (or SH) Shelf

The Model 1635-48-24-S19 and -SH shelves are designed to be mounted in standard 19" or 23" equipment racks respectively and can accommodate up to four Model 1635-48-24-20 converter modules. Blank front panels are provided for covering unused converter bays when the shelf is equipped with fewer than four modules. Standard paint color is light gray (ANSI-61).

#### Size and Weight

See Fig. 1 for overall dimensions

Module weight: 6 pounds (each)

Shelf weight: 17 pounds

#### Shelf Wiring Connections

Power cables and remote alarm wiring enter and exit the Model 1635 Power Shelves through knock-outs in the rear and side panels of the shelf enclosure. Termination of all power cables and alarm-status wires is through high-quality compression terminals which accept copper wire of appropriate gauge.

Separate input power connections are provided for each converter bay in the shelf (i.e. four sets). The outputs of all four converter bays are paralleled and terminated to provide one set of output terminals in the shelf. This wiring scheme helps to prevent a fault in one converter module from affecting others in the shelf.

#### Additional Information

For additional information about these and other Wilmore Electronics Company dc-to-dc converters, dc-to-ac inverters and uninterruptible power systems, please contact our Sales Department at (919) 732-9351 or FAX (919) 732-9359.

Information provided in this bulletin is subject to change without notice.

<sup>†</sup>Shelf dimensions shown for Model 1635-48-24-S19 (19" shelf). For Model 1635-48-24-SH (23" shelf), increase overall shelf width dimension from 19" to 23".