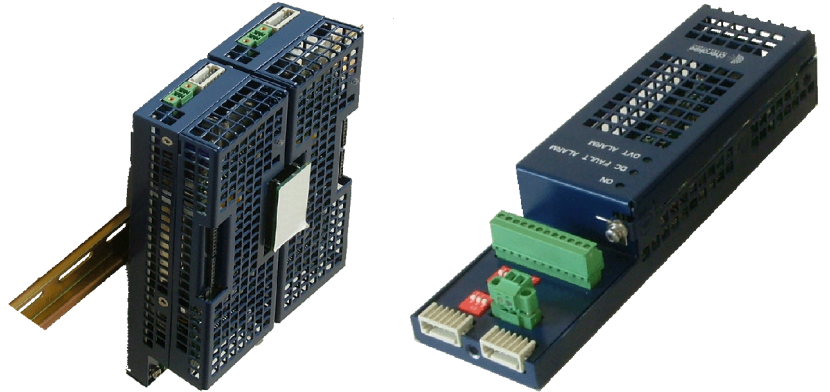


Product Features:

- Stand alone down converter for remote powering applications
- Complies with EN60950-21 RFT-C
- Up to 60W output power capability at 70°C
- Can be mounted in parallel to offer full n+1 redundant power
- Convection cooling
- Wall or Din rail mounting
- Field replaceable module
- Dual power level alarm when operating in parallel
- Optional monitoring for remote site



Reduced investment cost

The remote feeding solution operates on existing copper networks. It does not require any site safety approvals or input stage as it is not connected to the mains. It saves time and money to operators and enables them to quickly offer new services in remote areas. The module is designed to be mounted on a standard din rail or directly on a wall. Snap-in connectors allow quick connection to the load and to the feeding pairs. The module can be quickly and very cost effectively installed in the network as it does not require any connection to the utility network, nor any site safety approvals.

The energy system is designed to operate on temperature range from -25°C to 70°C in natural convection.

Progressive investment

If the load increases during the life cycle of the application (additional subscribers connected) up to three modules can be paralleled in the field supporting the right level of investment. For higher power loads see also other remote or local feeding solutions from Mitra E&I.

Cost effective reliability

The 60W remote energy solution from Mitra E&I is the perfect answer to provide high availability of power to remote sites in the local loop of the newest networks. The power supply unit connects to copper pairs networks powered at high voltage in the central office equipment. This solution takes advantage of the battery energy back-up power provided centrally. In this way high availability is provided at the remote site without increasing the number of remote battery locations and the exponential costs associated with their maintenance.

Redundancy at all levels

Redundancy can easily be achieved by mounting modules in parallel. Modules can easily be replaced in the field without interruption of power. The number of copper pair connections is designed to power each module independently for most distances. Optional accessory allows battery connection during maintenance or intervention on the network.

Safety

The remote feeding solution of Mitra E&I is very safe. On the top of standard EN60950-1 it is also designed in combination with a central up converter compliant with the IEC/EN60950-21 safety standard. In addition, any circuit failure will shut down the source of power eliminating any risk of electrical shock.



1 Safety

Certification

CE marked for low voltage directive
EN60950 and EN60950-21

Dielectric strength test (on every unit):

Input - output: 4240VDC
Input - earth: 2100VDC
Output - earth: 700VDC

Each pair properly connected to the central office up converter and to the Cherokee remote input card delivers up to 58mA / 18W at a voltage equal to 320V minus the voltage drop on the copper pair at 58mA. In such case the following protections apply:

Line to earth

The current between lines and ground is limited to 1.5mA per remote location.

Low line resistance

The current capability per pair is limited to 8mA when the output voltage of the DC/DC converter is below 245VDC. When the resistance of the line is such that the output voltage goes below 166V then the DC/DC converter output will go below 50V.

See also specification of the central office up converter systems CES48/xxL320RFM-2A

2 EMC Data

2.1 EMC - Emission EN50081 - 1

Port	Frequency range	Criteria	Reference standard
Enclosure	30 - 230 MHz	B	EN55022
(radiated)	230 - 1000 MHz		

2.2 EMC - immunity EN300 386

Port	Phenomena	Test	Criteria	Reference standard
Enclosure	Radiated RF fields	3 V/m 80 MHz - 1000 MHz 80% AM	A	EN61000-4-3 ETS 300 386 V1/1.3 ; 5.2.1
	ESD	8 kV air 6kV contact	B	EN61000-4-2 ETS 300 386 V1/1.3 ; 5.2.1
Ports	Conducted RF fields Immunity	130 dB μ V 0.15 MHz - 80 MHz	A	EN61000-4-6
	Fast transients Common mode	(5/50 ns) 1kV	B	EN61000-4-4 ETS 300 386 V1/1.3 ; 5.2.1
	Radiated RF Conducted continuous	3 V/m 0.15 80 MHz (80% AM) 150 ohms	A	EN61000-4-6 ETS 300 386 V1/1.3 ; 5.2.1
	Surge Common mode Differential mode	(1.2 / 50 μ s) 2 kV 1 kV	B	EN61000-4-5



3 Environmental Data

Parameter	Conditions	Min.	Max.	Unit
Temperature range	Operating free air convection	-25/(-13)	70/(158)	°C/(°F)
	Storage and transit	-40/(-40)	80/(180)	°C/(°F)
Relative humidity	Operating, non-condensing	5	95	%
	Storage and transit	5	100	%
Altitude	Operating	10/(1.3)	2500/(8200) 104/(14.8)	m/(feet) kPa/(psi)
	Storage and transit	10/(1.3)	12000/(39400) 106/(15.6)	m/(feet) kPa/(psi)
Vibration IEC 721-3-4 Constant amplitude: Constant acceleration: Storage and transport Constant amplitude: Constant acceleration:	Operating 2 to 9Hz 9 to 200Hz		1.5 5	mm g _{rms}
	2 to 9Hz 9 to 200Hz		3 10	mm g _{rms}
Shock	IEC 721-3-4		25	g



4 Electrical data

4.1 Input data

Parameter	Conditions	Min.	Nom.	Max	Unit
Input voltage		180	300	375	V
Low operating range		171	180	189	V
Start		155	160	165	V
Stop					
Source current	Per module at max. power		0.12	0.35	A
Efficiency	80% load, 25°C		88		%
Energy reserve			TBD		msec

4.2 Output data

4.2.1 Main outputs

Parameter	Conditions	Min.	Nom.	Max	Unit
Output voltage		47.5	48.0	48.5	V
Overvoltage protection		57		60	V
Output power capability	70°C free convection		60		W
Output current			1.25		A
Current limit	At 47.5V			1.6	A
Turn ON/OFF delay time	250V input		3	5	s
Regulation					
Line			±0.1	±0.4	%
Load			±0.4	±1	%
Temperature drift			±0.002	±0.05	%/°C
Dynamic operation	Minimum load 0.2A				
Overshoot/undershoot	$D1_{out}$ 50%, dI_{out}/dt 0.5A/μs			1	V
Recovery time				4	ms
Power sharing	Minimum load 10%, passive sharing		TBS	TBS	%
Narrow band noise	Meets ETS 300 132-2 §4.8				
Ripple and noise	Nominal input; full load, 25°C 20MHz BW			55	mV _{pp}

4.3 Optional Monitoring

Parameter	Conditions	Min.	Nom.	Max	Unit
Input voltage		40	48	60	V
Power consumption			3	6	W



5 Installing modules in parallel

Up to three modules can be mounted in parallel to offer more power and/or redundancy. Both input and output of the converter can be connected in parallel for higher availability of power signals.

6 Monitoring

6.1 System without optional monitoring module

The modules are so designed that they can supply two level of alarms (urgent and non urgent) without the need of a monitoring.

Converter output monitoring: One green led indicates proper operation of the system.

In addition an alarm normally open normally close changes its status when converter fails.

DC power monitoring: Modules can be parallelised.

When more 1 module is working (up to 3 modules), the DC Fault signal is considered as MINOR alarm on the module 1

and MAJOR alarm on the second module.

If only one module fails, the DC fault signal is considered as MINOR and is generated on the module1. (Change state of the relay)

If more one module fails, the DC fault signal is considered as MAJOR and is generated on the module 2 .

In that case, the MINOR DC fault on the module 1 is not active.

Input line fail: Any failure open circuit, short circuit, low impedance is reported at the central location alarm system.

6.2 Optional power and Monitoring

An optional monitoring offers the following functions. The monitoring is hot pluggable and can be disconnected without interruption of power

Visual interface

Monitoring led: A green led indicates the proper functioning. The led flashes every second when the monitoring temperature is out of range.

DC Fault Alarm: A red led flashes if one power module fails. It stays on if two units fail.

Temperature alarm: A separate red led flashes if the over temperature protection is activated on one module.

It stays on if the over temperature protection is activated on more than one module

Signals

Combination of all alarms and digital inputs on two dry relay contact (NC-NO)

Modulation of all alarms and output voltage measurement for transmission to the central office on a dedicated single copper pair.

Supervised inputs

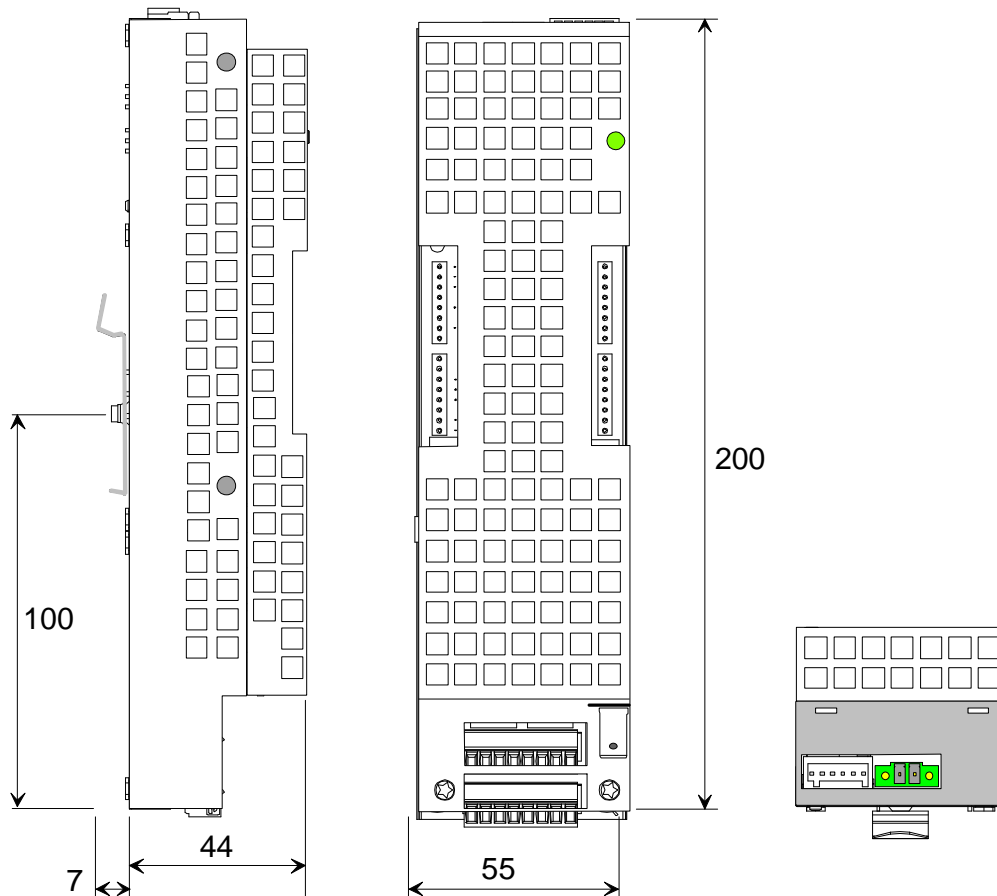
- o One module fail
- o More than one module fail
- o Temperature protection alarm of each module
- o Output bus voltage
- o Three uncommitted input non urgent alarm
- o Three uncommitted input urgent alarm
- o Monitoring failure
- o Monitoring temperature
- o Combined alarm status
- o Power module type and numbers of modules installed

6.3 Full site monitoring and access management

For more monitoring options such as access control, environmental variables, safety variables, as available for



7 Mechanical



Weight: 500g

7.1.2 Connections

Input twisted pairs:

Manufacturer : PHOENIX
Connector Type: MCV 1.5/8 – G –3.5
Mating Connector Type : MC 1.5/8 – ST –3.5

Output connector

Manufacturer : PHOENIX
Connector Type on the Unit : MCV 1.5/2 – GF –3.81
Mating Connector Type for user : FRONT-MC 1.5/2 – STF –3.81

Signal connector:

Manufacturer : WAGO
Connector Type on the Unit : Multisystems MICRO (733-366)
Mating Connector Type for user : Multisystems MICRO with cage Clamp (733-106)
Wire : AWG 28-20 (0,08-0,5 mm²)

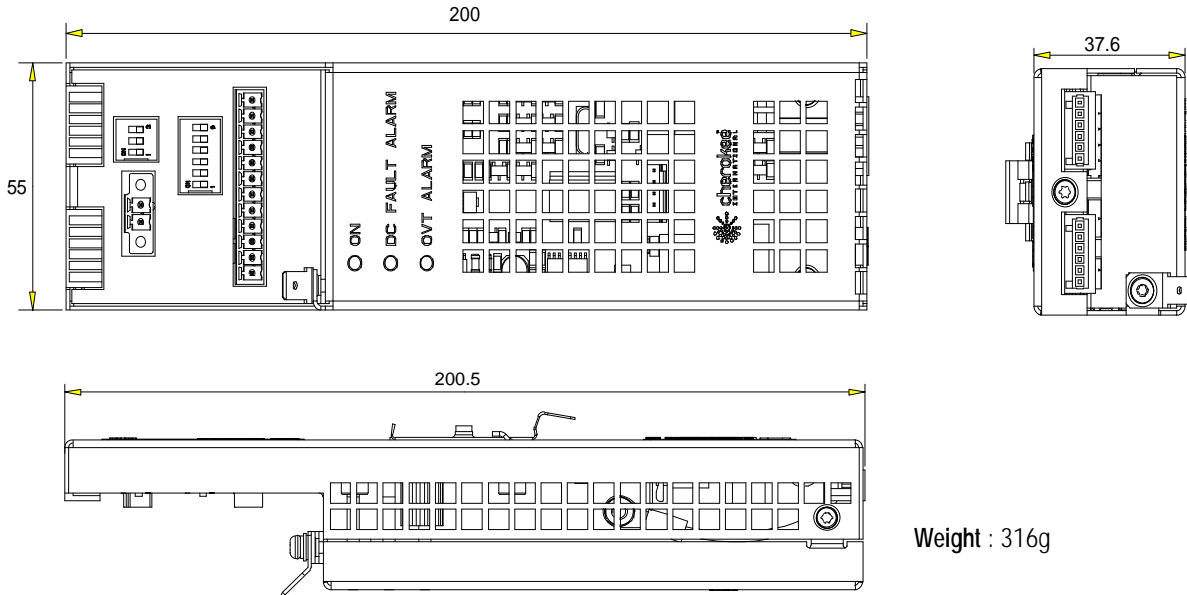
Grounding: Terminal type: Faston 6.3 (45°)

Converters are field replaceable



7.2 Monitoring unit

7.2.1 Outline drawing



Weight : 316g

7.2.2 Connections

Input power connector

Manufacturer : PHOENIX
Connector Type on the Unit : MCV 1.5/2 – GF –3.81
Mating Connector Type for user : FRONT-MC 1.5/2 – STF –3.81
This input is protected against reverse polarity.

Input converter alarms connectors

Manufacturer : WAGO
Connector Type on the Unit : Multisystems MICRO (733-366)
Mating Connector Type for user : Multisystems MICRO with cage Clamp (733-106)
Wire : AWG 28-20 (0,08-0,5 mm²)

Input external alarm connector

Manufacturer : PHOENIX
Connector Type on the Unit : MCV 1.5/12 – G –3.5
Mating Connector Type for user : MC 1.5/12 – ST –3.5

Modulated signal for central up-converter monitoring

Manufacturer : PHOENIX
Connector Type on the Unit : MC 1.5/2 – G –3.5
Mating Connector Type for user : MC 1.5/2 – ST –3.5

Output local alarm signals connector

Manufacturer : WAGO
Connector Type on the Unit : Multisystems MICRO (733-366)
Mating Connector Type for user : Multisystems MICRO with cage Clamp (733-106)
Wire : AWG 28-20 (0,08-0,5 mm²)

Internal contacts are free electrical potential (relay)

Contact rating : 1A max / 60VDC resistive/linear load

Grounding: Terminal type: Faston 6.3 (45°)



8 Product overview and ordering information

Description	Order Multiple	Order number
Remote Energy Converter 6 lines 60W/48V	1	REC006D48FN
Cardboard dimensions		TBD
Packaging weight		TBD
Optional Monitoring Module	1	REM006L3MOD
Cardboard dimensions		TBD
Packaging weight		TBD
Accessories		
Connector kit for 60W power module (includes signal, input power and output power)	1	5304 500 00861
Connector kit for 60W monitoring	1	5304 500 00871
Input power connector	50	5304 500 00721
Alarm connector (usable for power module and monitoring)	100	5304 500 00891
DC Output Power connector (output of power and inpput of monitoring)	50	5304 500 00901
Connector to parallel two power units	25	5304 500 00671

The information contained within this specification is believed to be true and correct at the time of publication, however, Mitra Energy & Infrastructure accepts no responsibility for consequences arising from printing errors or inaccuracies.

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