

ELECTRICALLY INTEGRATED ENCLOSURES

19" LAB RACKS & FLIGHT CASES



POSITIVE PROBLEM SOLVING **+=**

Selected AC and DC power systems from ETPS can be treated to a full electrical integration. Lab racks can be provided with static bases or heavy duty locking castors. Wheeled flight cases with shock and vibration mounts are also available.

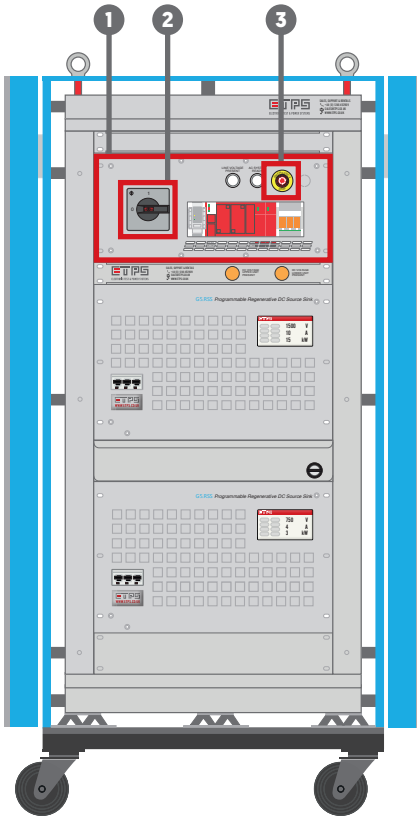
Standard features include a panel mounted emergency stop, lockable mains switch and locking ventilated rear door. Common options include isolation monitoring, passive indication of any residual DC voltage, and a mechanical switch panel.

Additional free space can be specified for the build, should you also want to mount your own equipment into the same enclosure. Multiple power systems can be fitted into the same case, powered from the a single AC lineside input. It is also possible for selected units to be retrospectively integrated into new racks on request.

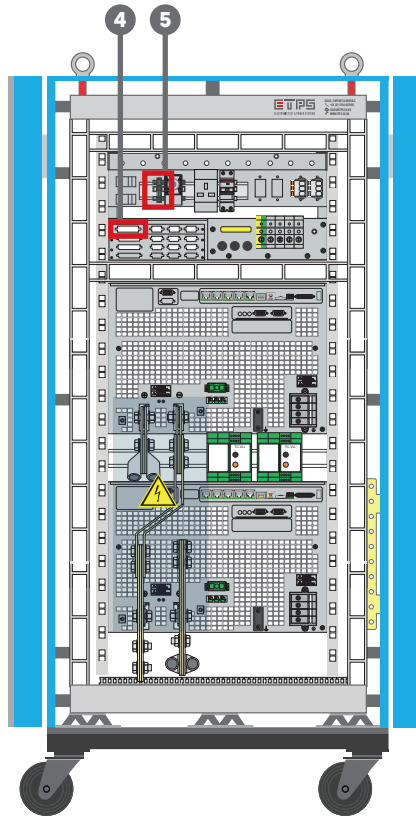
- + Performance Level e Possible**
- + Single Mains Interface Unit**
- + Panel Mounted Emergency Stop**
- + Reconfigurable Mechanical Switch Panel**
- + Isolation Monitoring Available**
- + Optional AC & DC Cables**

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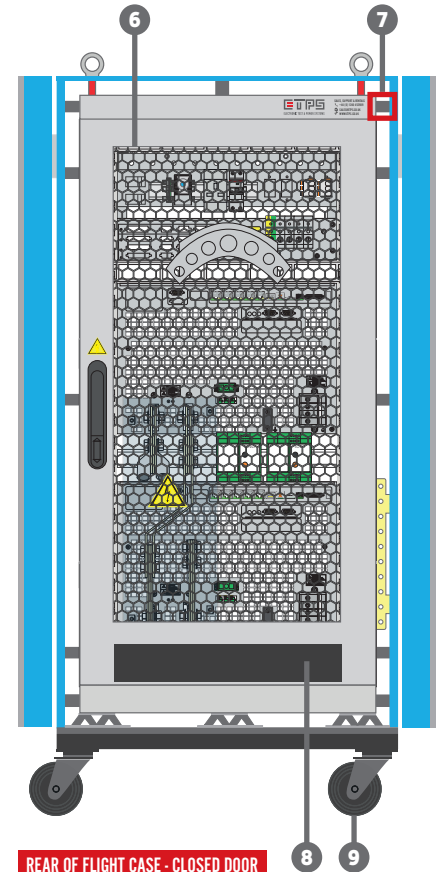
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FRONT OF FLIGHT CASE



REAR OF FLIGHT CASE



REAR OF FLIGHT CASE - CLOSED DOOR

FEATURES

ITEM	DESCRIPTION	LAB RACK	FLIGHT CASE
1	Single Mains Interface Unit	✓	✓
2	Lockable Mains Switch	✓	✓
3	Panel Emergency Stop [DC Units Require /ISR]	OPTIONAL	OPTIONAL
4	Interface for Connection to External Emergency Stop	OPTIONAL	OPTIONAL
5	Auxiliary 24V Power Supply	OPTIONAL	OPTIONAL
6	Locking Ventilated Rear Door	✓	✓
7	Shock and Vibration Mounts	✗	✓
8	Brush Strip for Cable Access	✓	✓
9	Locking & Swivel Castors [/XCD Required on Units]	OPTIONAL	✓
-	Unit(s) Mounted into Enclosure	✓	✓
-	Bottom Cable Entry	✓	✗
-	Rear Cable Entry	✓	✓
-	Top Cable Entry	OPTIONAL	✗

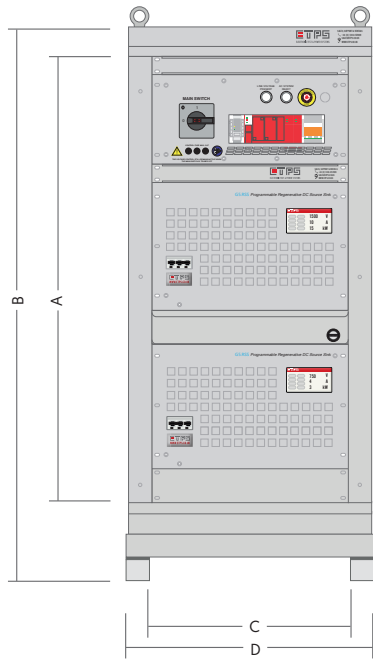
OPTIONS

CODE	DESCRIPTION
FORM FACTOR AND ENCLOSURES	
/CAB-LR18U	Integration into an 18U lab rack
/CAB-LR25U	Integration into a 25U lab rack
/CAB-LR32U	Integration into a 32U lab rack (double width cabinet possible on request)
/CAB-LR37U	Integration into a 37U lab rack (double width cabinet possible on request)
/CAB-LR42U	Integration into a 42U lab rack (double width cabinet possible on request)
/CAB-LR46U	Integration into a 46U lab rack
/CAB-FC25U	Integration into a 25U flight case
/CAB-FC32U	Integration into a 32U flight case
CABLES	
/INACC	AC lineside cable and plug (/XCD required on units)
/OUTDCC	DC loadside cable set
/OUTDCS	DC loadside sockets
/OUTACC	AC loadside cable set
/OUTACS	AC loadside sockets
INTERFACES AND CONTROL	
/SCREEN	Integrated monitor to operate standard and optional GUIs (compatible systems only)
/PW	Pre-wired slot for future expansion of additional module(s)
/RCU	19" x 3U rackmounting remote control unit with 5" lockable HMI touchscreen, for DC systems only
/RCU-DT	Desktop remote control unit with 5" lockable HMI touchscreen, for DC systems only
/INACSI1PH	UK 3 pin (type G) socket (230V/13A) for powering ancillary equipment (e.g. laptop)
/SSB	External start/stop box allowing cabinet(s) to be switched ON/OFF remotely, requires /SOFTSTART
SAFETY AND PROTECTION	
/ACI	Passive lineside indicator for showing AC present and correct rotation
/ISO	Isolation monitoring
/SOFTSTART	Motorised soft-start relays for mains interface unit
/BASEPLATE	Base plate covering bottom of lab rack models
/TOPCAB	Top cable entry for static lab racks
/VLI	Passive DC voltage level indicator with adjustable threshold
/SAFREL	Safety Relay to reach Performance Level e (/ISR required on units)
/SAFLIG	Beacon light for the enclosure
/MLO	Mechanical lock-out switch connected to ISR (/ISR required on units)
/ESTOP	Fixed e-stop on front panel of cabinet (requires /ISR option for DC module)
/EXTSTOP	Removable e-stop with magnetic base and cable
MECHANICAL	
/IP54	IP54 enclosure, for lab racks only
/CASTORS	4x swivel castors, 2 with brakes, for lab racks only - standard for flight cases (/XCD required on units)
/HANDLES	Handles mounted to enclosure to aid mobility
/RSC	Automated switching between master/slave and independent configurations via a PLC controlled contactor arrangement
/TESTCELL	Small test cell integrated into cabinet
/SWITCHPANEL	Reconfigurable mechanical switch panel between master/slave and independent configurations
/DRAWER	Lockable accessory drawer (e.g. for laptop and small parts)
/HOOK	Winding hook for cable storage

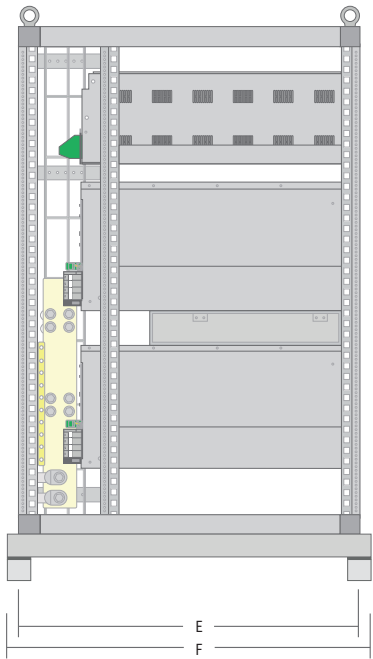
STANDARD DIMENSIONS

DIMENSION	LAB RACKS (WITHOUT CASTORS)						FLIGHT CASES	
	/CAB-LR18U	/CAB-LR25U	/CAB-LR32U	/CAB-LR37U	/CAB-LR42U	/CAB-LR46U	/CAB-FC25U	/CAB-FC32U
A (Internal Rack Height)	18U	25U	32U	37U	42U	46U	25U	32U
B (External Enclosure Height)	1080mm	1350mm	1700mm	1900mm	2100mm	2370mm	1535mm	1835mm
C (Internal Rack Width)	19"	19"	19"	19"	19"	19"	19"	19"
D (External Enclosure Width)	650mm	650mm	650mm	650mm	650mm	650mm	850mm	850mm
E (Internal Rack Depth)	Dependent on power units installed							
F (External Enclosure Depth)	Dependent on power units installed							

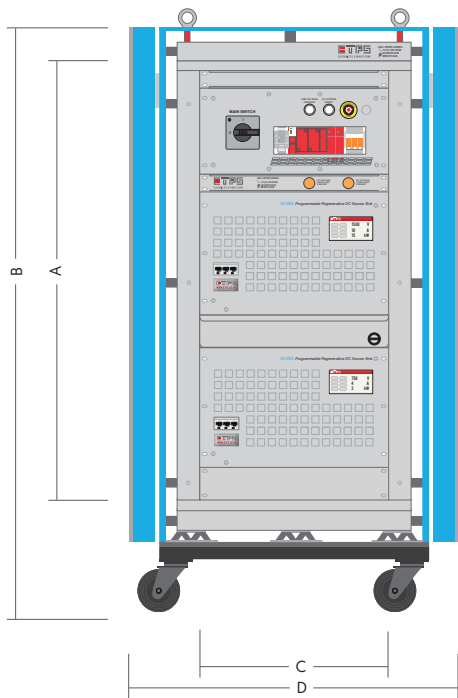
* Dimensions for single width enclosures only



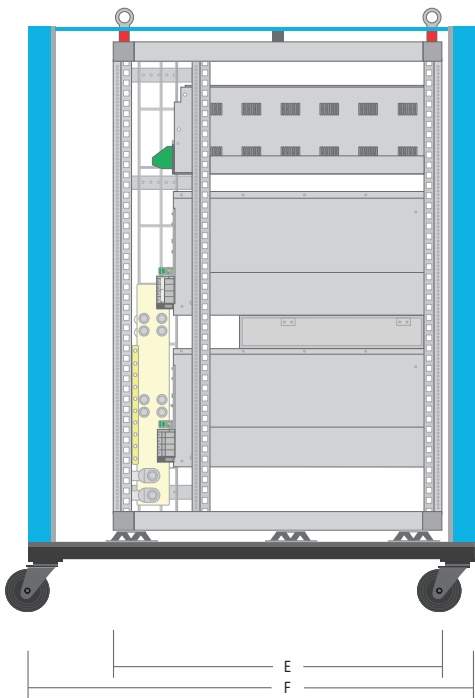
FRONT OF LAB RACK



SIDE OF LAB RACK



FRONT OF FLIGHT CASE



SIDE OF FLIGHT CASE

HIGHLIGHTED OPTIONS

AC LINESIDE CABLE AND PLUG (/INACC)

The below 5-pin (3L+N+PE) plugs can be installed with your chosen power system. As standard, cables are supplied with 5m length. Please let us know if you require a different length of cable. On request 4-pin (3L+PE) plugs can be specified.

- + CEE-16A-5M
- + CEE-32A-5M
- + CEE-63A-5M
- + CEE-125A-5M



AC INPUT CABLE

AC OR DC LOADSIDE CABLE SET (/OUTACC /OUTDCC)



DC CABLE SETS

AC or DC cables can be provided to suit the size, connection type and distance of the power system and DUT.

+ - AC OR DC LOADSIDE SOCKETS (/OUTACS /OUTDCS)

A variety of AC or DC sockets can be fitted according to requirements for quick and easy deployment. If you have a specific standard or brand which you require to be installed, please do let us know.



DC SOCKETS



AC SOCKET

HIGHLIGHTED OPTIONS

INTEGRATED SCREEN FOR GUIs (/SCREEN)

A screen can be integrated into 19" cabinets, which allows the standard and optional GUIs to be viewed and controlled locally.

Different sizes and interfaces are available, as well as options for touch screen and ruggedisation.

Optional GUIs for select DC systems:

- + Battery Simulation
- + Battery/Electric Drive Cycling
- + Function Generator with Sweep Mode
- + Solar Array Simulation
- + Fuel Cell Emulation with AAP

Optional GUIs for select AC systems:

- + Grid Simulation with Fourier Tool
- + RLC Load
- + Current Control
- + Grid Impedance Emulation
- + EMC Testing



CABINET WITH SCREEN

LINESIDE AC INDICATOR (/ACI)

Panel mounted LED indicators lit by the lineside AC. The 'line voltage present' LED will only illuminate if the lineside phase rotation is correct, serving as a useful check on initial connection. If the lineside rotation is correct, then the LED will remain illuminated as long as AC is present at the lineside terminals to the system. It is a useful indicator that operates when the system mains isolator or individual breakers to the module are switched off.

Additionally, the ACI's error contact can be used as an enable or emergency signal. The AC-Indicator triggers when the line voltage [L-L] level falls below 85% of its nominal value or when phases are missing.



AC INDICATOR

HIGHLIGHTED OPTIONS

PRE-WIRED SLOT (/PW)

A fully tested pre-wired slot can be included to cover future requirements for an additional unit that can be added by the user on-site at a later stage. This option includes pre-assembled and tested cabling, an additional blanking plate, and dummy plug for the ISR circuit.

REMOTE CONTROL UNIT (/RCU)

A 19" rackmounting HMI unit, for DC systems. It can be fitted externally to reduce response times when implementing complex changes. This is also useful when the power supply operates in potentially hazardous environments such as test cells.

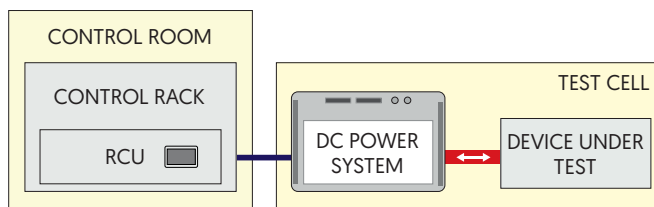
Multiple units can be controlled from the same RCU if required, as a single point of control. External controls can be positioned at a user-friendly height, and mounted on the exterior of IP54 enclosures to maintain protection.



MULTIPLE MODULES IN IP54 CABINET



EXTERNAL RCU



DESKTOP RCU (/RCU-DT)

A desktop version of the external HMI, for DC systems. It can be operated at a distance of up to 40m. This is particularly useful where the power system may be operating in a potentially hazardous environment, such as a test cell with rotating machinery.

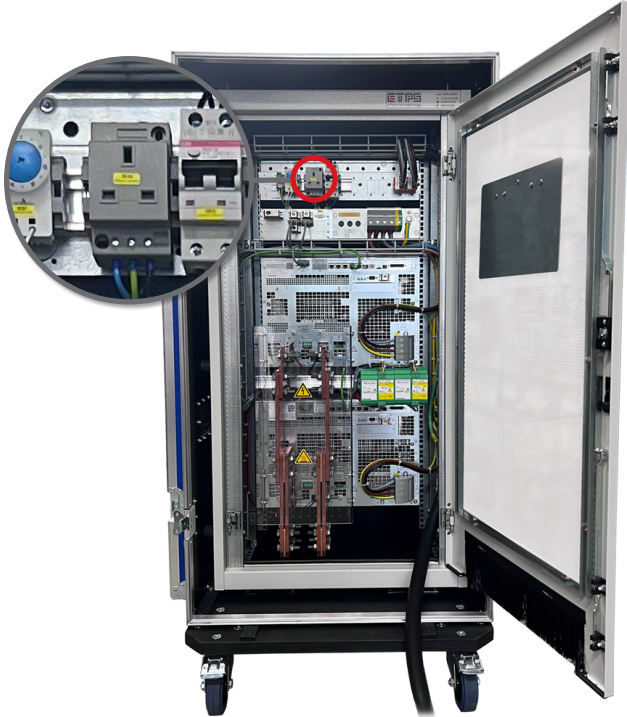


DESKTOP HMI

HIGHLIGHTED OPTIONS

SERVICE SOCKET (/INACS1PH)

UK 3 pin (type G) socket [230V/13A] for powering ancillary equipment.



SERVICE SOCKET

START/STOP BOX (/SSB)

External start/stop box allowing cabinet[s] to be switched ON/OFF remotely. Requires /SOFTSTART.



SAFETY AND PROTECTION

HIGHLIGHTED OPTIONS

MECHANICAL LOCK-OUT (/MLO)

Cabinet mechanical lock-out switch connected to the ISR of each module. Allows users to connect to the software of the system without risk of the loadside being energised.

BASE PLATE (/BASEPLATE)

Base plate covering bottom of lab rack enclosure. Cable routing will therefore only be possible via the cable brushes in the rear door.

SOFT-START (/SOFTSTART)

Motorised soft-start relays for the mains interface unit. Activates units within a cabinet sequentially to spread out the startup current.

TOP CABLE ENTRY (/TOPCAB)

Provides access for cables from the top of the enclosure. Available for lab rack models only.

EXTERNAL E-STOP (/EXTSTOP)

Removable e-stop with magnetic base and cable.



HIGHLIGHTED OPTIONS



VOLTAGE LEVEL INDICATOR (/VLI)

A VLI can be built into the cabinet, which shows whether the DC bars are energised. The VLI is connected across the output bars and is passively powered by the energy present.

Therefore, an indication is available to the user even if the power system is shut down or the power generation is off. The VLI is a useful safety feature particularly in test systems where the DUT has significant energy storage capabilities.

The VLI is mounted at the rear of the cabinet across the overall system's DC bars. An LED is fitted to the front panel of the system and indicates if the VLI is measuring above the adjustable threshold of 15-100Vdc, which can be set by request prior to delivery. In the example above, the LED is set to remain lit when the voltage is above a default of 20Vdc. The VLI is limited to systems operating from 0 to 1500Vdc.



VLI



ISOLATION MONITORING (/ISO)

A programmable isolation monitoring device can be mounted into the cabinet and integrated into the safety system. The Isometer is used to monitor the isolation resistance of the loadside connections of an IT-System (AC or DC) according to IEC 61557-8. Two independent resistance threshold values are factory set, which can be user defined if required. The system's leakage capacitance can also be set.

If the isolation resistance falls below one of the thresholds, the corresponding error relay will be triggered. The trigger levels and other parameters can be adjusted by the user via the setup menus using the device buttons and graphic display. Further the display can be used to perform system diagnostics including: checking the graphical representation of the insulation resistance over time, checking the error history memory with real-time clock or check the system state. The device possesses an automatic self-test.

The Isometer can be easily deactivated via a front panel switch when operating a DUT (such as a battery pack) with an existing integrated isolation monitor. It can also be deactivated when the system has one DC cable grounded. Where more than one power system is installed, multi-channel Isometers are also available.



SAFETY RELAY (/SAFREL)

Safety Relay to reach Performance Level e according to EN ISO 13849-1:2023. Includes an interface for an external e-stop system, with bidirectional operation. Pressing the e-stop on the rack can trigger shutdown of external equipment.



SAFETY RELAY WITHIN MAINS INTERFACE UNIT



BEACON LIGHT (/SAFLIG)

Beacon light for signalling system status to operators. On a magnetic base for easy repositioning.



BEACON LIGHT

HIGHLIGHTED OPTIONS



IP54 ENCLOSURE (/IP54)

An IP54 level of Ingress Protection for lab rack enclosures provides a high level of protection against non-conductive airborne pollutants. Protection against water splashes from all directions is also provided, which can occur in scenarios such as a burst water pipe or sprinkler system being activated.

Liquid cooled enclosures are also possible, ideal for facilities which don't have sufficient provisions for extracting hot air dissipated into the atmosphere by an air cooled power system. As the cabinet is enclosed, ambient noise levels are also reduced. A liquid cooled enclosure can also help maximise available floor space in cramped facilities.

Typically an air cooled system requires significant clearance space at the front and rear of the cabinet, to ensure adequate ventilation to avoid overheating. In contrast, an IP54 liquid cooled enclosure can be positioned next to another surface with no effect on the cooling mechanism.



162kW STATIC LIQUID COOLED CABINET



LOCKING & SWIVEL CASTORS (/CASTORS)

Locking and swivel castors can be fitted to enclosures to aid mobility. This is particularly advantageous when several departments or test cells share the same equipment. Fitted as standard for flight cases and optional for lab racks. Requires /XCD on units.



LOCKING & SWIVEL CASTORS



HANDLES (/HANDLES)

Handles can be mounted onto the enclosure for easier repositioning of mobile systems. The handles are mounted at a suitable working height on the left and right sides of the system front.



CABINET HANDLES

HIGHLIGHTED OPTIONS

REMOTE SWITCH (/RSC)

The Remote Switching Configuration unit (RSC) offers fast and easy switching between master/slave configurations. It enables pre-programmed switching operations to be carried out remotely and automatically via power contactors. The core of this system extension is a programmable logic controller that drives the switching operations and monitors them independently.

With the help of the automatic switchgear, the change from one configuration to a completely different one takes only a few seconds. No cables need to be reconnected in the modules or at the control level. This makes it ideal for fully automated test runs and sequences.

The RSC unit can adapt configuration types (parallel, series, mixed), split the device network into smaller power units, and route the power to different test stations. Power is supplied at the test stations via PDU units (Power Distribution Unit). The remote switching unit is controlled via a touch display or can be operated via the automation test system using a variety of interfaces.



2MW RSC UNIT WITH GUI INTERFACE

INTEGRATED TEST CELL (/TESTCELL)

Test cells can be integrated into 19" rackmounting enclosures. Ideal for labs with limited floor space.

Each cabinet is built to order, so we can look to meet any non-standard requirement you may have. For example, the test cell pictured was built with the following features:

- + 2x Amphenol Surlock 8mm (SLPRBTPNO) on rear panel within test space
- + Transparent safety glass door with 2 channel limit switch to safety system
- + Insulated base mat on DUT shelf
- + Integrating cooling fan on rear panel within test space
- + Opening (50mm diameter) on rear panel within test space for user comms



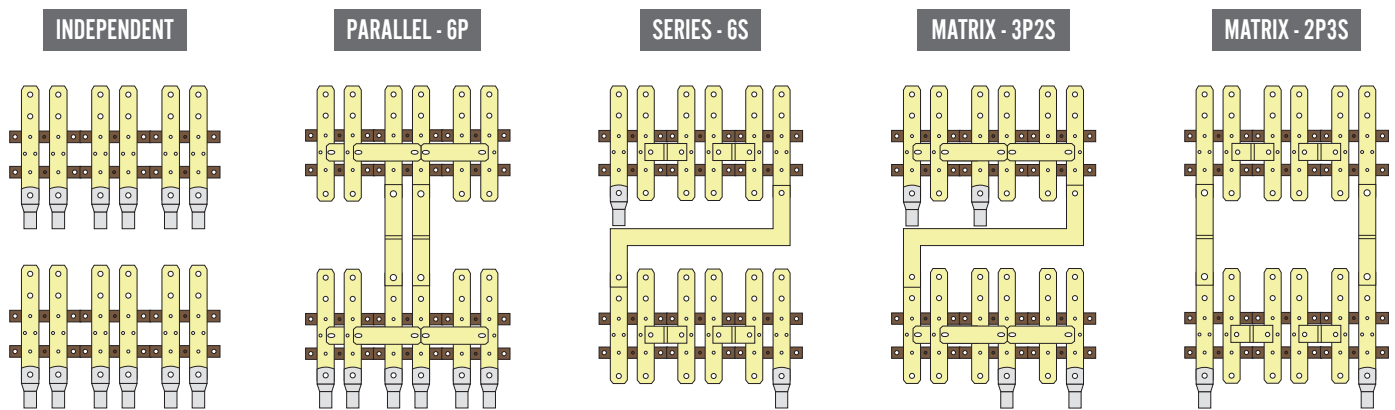
INTEGRATED TEST CELL

HIGHLIGHTED OPTIONS

SWITCH PANEL (/SWITCHPANEL)

A reconfigurable mechanical switch panel for changing between master/slave and independent configurations. The switch panel links the DC bars of each of the modules to one connection point. Switching between parallel, series and matrix configurations is done simply by changing mechanical links within the panel. This can be used to simplify reconfiguration and minimise potential user errors.

The example below shows a previous switch panel for 6× 500V/54kW G5-RSS modules.



ACCESSORY DRAWER (/DRAWER)

Lockable draws are available on the front of the enclosures providing simple storage of documents and small accessories.



ACCESSORY DRAWER



WINDING HOOK (/HOOK)

For added convenience, a hook is included to hang the cabling. The hook can be positioned on the side or rear of the unit.



REAR WINDING HOOK



SIDE WINDING HOOK



“
**WE ARE
POSITIVE
PEOPLE**
”

ETPS engineer electronic power supply and testing systems. Our problem solving skills provide the spark of innovation to some of the world's leading technology brands.



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POSITIVE PROBLEM SOLVING