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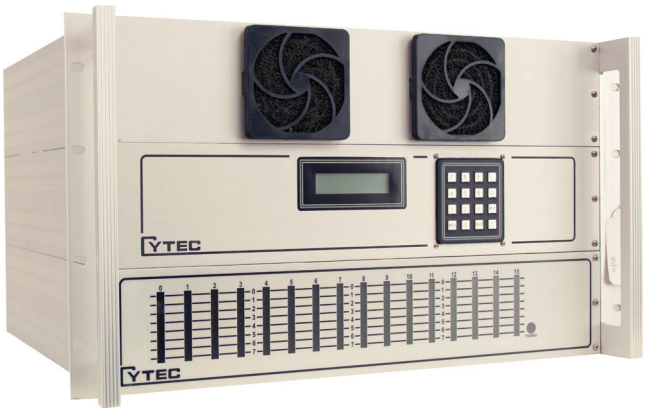
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HXV SERIES
HIGH VOLTAGE SWITCHING SYSTEMS

The HXV Series are computer controlled switching systems designed for High Voltage applications. Standard systems handle signals up to 5000 volts RMS. Custom systems switching up to 25 KV are possible. Typically applications include Hi-pot and high voltage IR testing.

HXV/128 Mainframe with keypad manual control



FEATURES:

- **Standard relays hot switch up to 3500 volts or 3 amps and carry 5000 volts RMS and 5 amps.**
- **Customized systems switch up to 40 KV.**
- **Front panel LEDs show switch status and aid in debugging.**
- **Computer Control via Ethernet LAN, IEEE488 (GPIB), RS232 Serial Standard. TTL Optional.**
- **Remote Status feedback to controlling computer.**
- **Manual Control option for use without computer control.**

CHASSIS:

The **HXV** Units are 19" rack mounted chassis, and are available as either mainframes or expansion chassis that are pre-wired to hold any of the HXV Series high voltage switch modules. All chassis have front panel LEDs showing open and closed switch points. High Voltage I/O connectors protrude through the rear panel.

HXV/32 Mainframe or -E Expansion Chassis -- 32 relay drives allow four HXV/8x1 or HXV/4x2 modules to be installed, or two HXV/8K modules. This chassis is 5.25" high.

HXV/96 Mainframe or -E Expansion Chassis -- 96 relay drives, controlling up to 12 HXV/8x1 or HXV/4x2 modules, or six HXV/8K Switch Modules in a 7" high chassis.

HXV/128 Mainframe or -E Expansion Chassis -- Up to 128 relay drives. Controls up to 16 HXV/8x1 or HXV/4x2 modules, or eight HXV/8K modules in a 10.5" high chassis.

Expansion Chassis - Up to 16 expansion chassis are run from a single Mesa Controller, allowing systems with up to 8096 switch points to be built. HXV chassis can be mixed with other Cytec products to provide a complete turn-key switching solution. See also the **MESA Bulletin**.

SWITCH MODULES:

HXV/8x1 Modules -- Individual modules can be wired together to build larger 1xN multiplexer configurations. Interconnects are located either externally or inside the chassis using screw terminal connectors built into the switch modules.

HXV/4x2 Modules -- Are used to build 2xN matrices. Useful for HiPot testing and Insulation Resistance testing where Hi and Low must be switched between any two of several measuring points.

HXV/8K Modules -- 8 SPST discrete relays which can be externally interconnected to form various configurations.

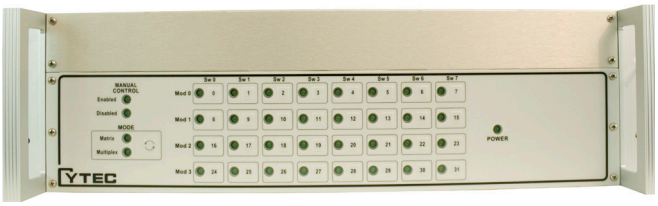
HXV CHASSIS

The HXV Chassis are 19" rack mounting units with built-in power supplies that are designed to hold the HXV Series switch modules. Switch modules are mounted so that their I/O connectors protrude through the rear panel. Every chassis front panel has discrete LEDs showing the status of every switch point. The front panel also holds the optional manual control.

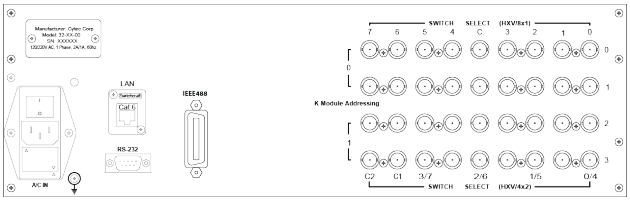
HXV/32 MAINFRAME OR -E EXPANSION CHASSIS

This chassis controls 32 switch points. A number of different switching configurations are possible. Add the required switch module(s) and a control module to complete the system.

Dimensions: 19" rack mount (483 mm)
15" deep (381 mm)
5.25" (2 RU) high (89 mm)
Weight: 20 lbs (9 Kg) max
AC Power : 75 watts max. 110/220 VAC selectable.



HXV/32 with pushbutton manual control option



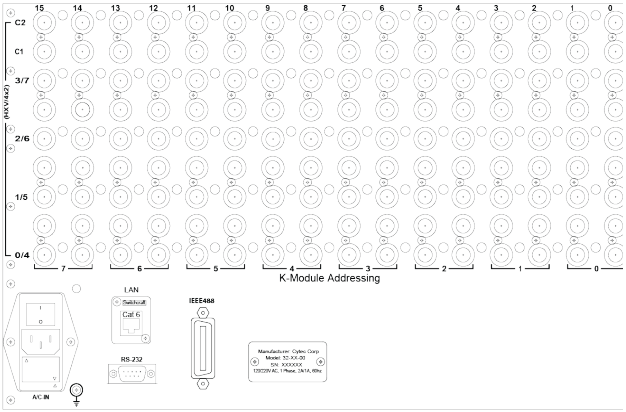
HXV/128 MAINFRAME

This chassis controls 128 switch points, and a variety of different configurations are possible. CP8 Display/Driver Modules drive the associated switch modules and have built-in LEDs showing switch status. The LEDs are visible throuth the front panel. Add switch modules, the CP8s, a control module and the optional manual control to complete the system. Standard chassis measure 15.6" deep and 10.5" high. Purchasing a larger than needed mainframe, only partially filled, provides for cost-effective future expansion.

Dimensions: 19" rack mount (483 mm)
15" deep (381 mm)
10.5" (4 U) high (267mm)

Weight: 40 lbs (18 Kg) max
AC Power : 150 watts max. 110/220 VAC selectable





ALL CHASSIS

Material: Gray anodized extruded or sheet aluminum with a polycarbonate front panel overlay.
Mounting Hardware: Rack Mount handles are standard. Flush mount flanges available at no added cost.
Protection: Selectable AC input fused at: 2 amps 110 VAC, 1 amp 220 VAC.

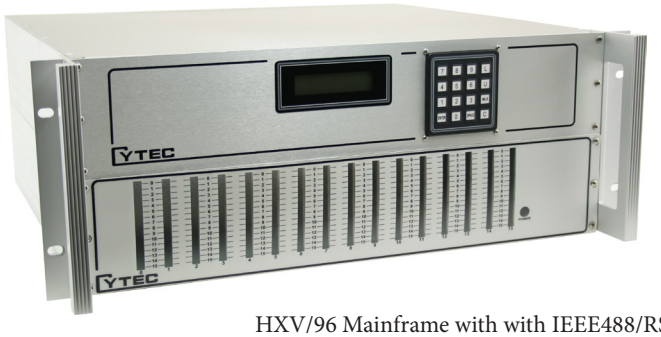
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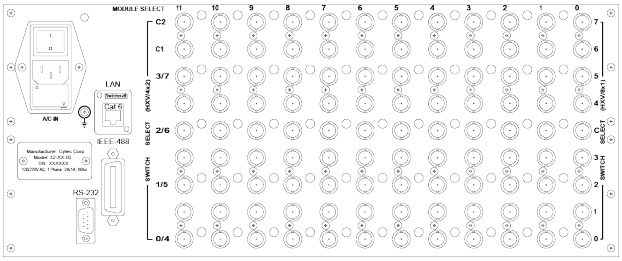
HXV/96 MAINFRAME

This chassis controls up to 96 switch points. A typical application would be 12 HXV/8x1 Switch Modules, but many configurations are possible using different switch modules. One CP8 Display/Driver Modules is needed to drive each switch module. The CP8s also have built-in LEDs that show switch status. Add switch modules, the required CP8s, a control module and the optional manual control to complete the system. Standard chassis measure 15.6" deep and 7" high. Purchasing a HXV/96 chassis only partially filled with switch modules allows cost-effective future expansion.

Dimensions: 19" rack mount (483 mm)
15" deep (381 mm)
7" (4U) high (178 mm)

Weight: 30 lbs (14 Kg) max
AC Power : 150 watts max. 110/220 selectable





HXV/96 Mainframe with with IEEE488/RS232, Ethernet and manual MC-2 Keypad Controls

HXV EXPANSION CHASSIS

HXV/32, /96 and /128 are also built as expansion chassis that are used with a MESA Control Chassis as shown in the **MESA Bulletin**. Multiple expansion chassis allow large or complex systems having one point of control to be configured, resulting in cost savings. Expansion chassis do not have control modules installed. Add switch modules and CP8 Display/Driver Modules for the HXV/128 and HXV/96 as needed to complete the system.

CONNECTORS

Three standard connectors are offered:
1) Binding Post / Banana Jack -- Simple, multiple connection method using stripped hookup wire or Banana plugs.
2) Shrouded Banana Jacks -- Easy, inexpensive connections with shields offer higher safety than standard BP connectors.
3) Coaxial SHV -- used for applications requiring shielded external wiring for safety codes. SHVs are similar to BNCs but can NOT be plugged into BNCs. More expensive and more difficult to wire but required in some installations for safety reasons.



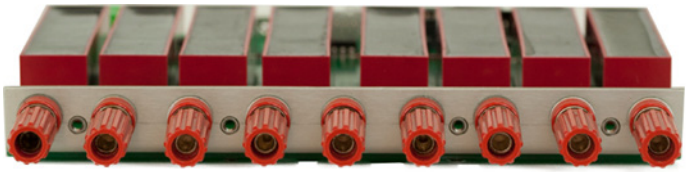
BP- Binding Post (Banana Jack)



SBP - Shrouded Banana Jack



SHV - Shielded High Voltage



HXV/8x1-BP Switch Module

LED INDICATORS / STATUS FEEDBACK

All HXV Mainframe and Expansion Chassis have LED displays that show the on/off state of every relay. The LED indicators are visible on the front panel and are labeled to match the programmatic address of the relays.

The LEDs provide an invaluable aid for program debugging and troubleshooting. They allow the user to easily verify switch point status by simply looking at the front panel.

HXV/32 chassis have 32 switch status LEDs built into the front panel. The LEDs are included in the chassis price.

HXV/ 96 and /128 Mainframes chassis require one CP8 Display Module to drive each switch module. CP8 LEDs are visible through cutouts in the front panel. These display modules must be purchased separately, in addition to the switch modules.

HXV CUSTOM SYSTEMS

CYTEC Corp. takes pride in building custom systems that meet non-standard or special customer specifications. Please call 1-800-346-3117 or email sales@cytec-ate.com to contact an Application Engineer and discuss details.

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HXV SERIES SWITCH MODULES

The HXV Series switch modules are built with high voltage reed relays that hot switch up to 3500 volts and cold switch or carry 5000 volts. Applications include HiPot testing, insulation breakdown testing and other extreme voltage requirements. Standard I/O signal connectors are either -BP (Binding Posts), -SBJ (Shrouded Banana Jack) or -SHV coaxial. The modules can be wired together internally to furnish larger configurations while eliminating external connections. For example, chassis can be supplied pre-wired as 32x1 to 128x1 multiplexers, or as 16x2 to 64x2 matrices.

HXV/8x1-HV-BP or SBP or SHV

This switch module has eight Form A (Normally Open) relays arranged in an 8x1 configuration as shown in **Fig. 1**. A screw terminal connector is built into the module so that the COM connections of several modules may be wired together inside the chassis to form larger multiplexers without external connections.

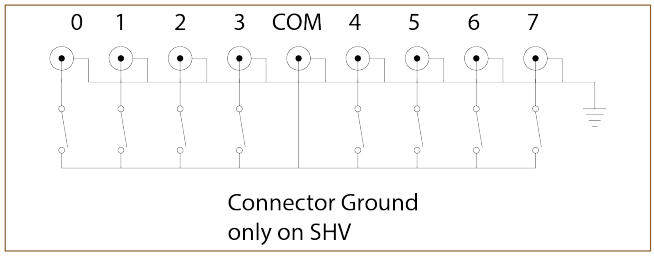


Fig. 1 HXV/8x1-HV Switch Module

HXV/4x2-HV-BP or SBP or SHV

This switch module is built with eight Form A (SPST) relays arranged in a 4x2 matrix configuration as shown in **Fig. 2**. Built-in screw terminal connectors allow the two COM connections to be wired together with other switch modules inside the chassis to form larger matrices such as 8x2, 16x2, etc.

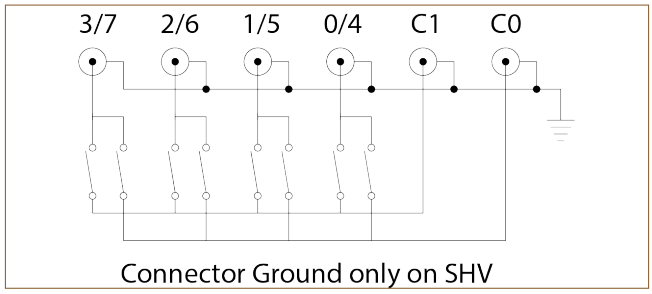


Fig. 2 HXV/4x2-HV Switch Module

HXV/8K-HV-BP or SBP or SHV

This module is built with eight individual Form A Normally Open relays. Each relay is wired out to one input and one output connector. See **Fig. 3**. The module takes up a double slot in the chassis due to the 16 connectors necessary. It is a convenient way to build configurations such as multiple 1x2's or can be used as isolation relays to protect other devices that need to switched in at lower voltages.

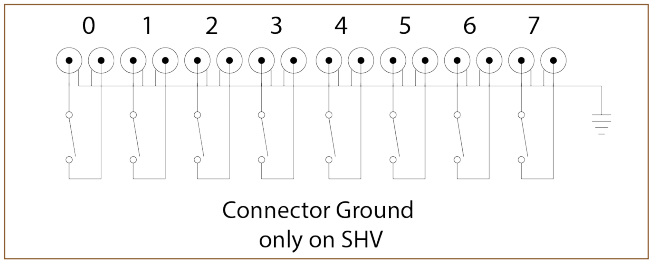


Fig. 3 HXV/8K-HV Switch Module

HXV/8K-P-BP or SBP High Current Power Switch

This module is a power switch built with eight individual Form A Normally Open high current relays for current bond testing or driving external devices. It can be used to build almost any configuration by adding external interconnects.
This module has 1200 V_{RMS} Breakdown voltage and can hot switch 3000 VA or 150 Watts DC. Carry current is over 20 amps. See **Fig. 4**. The module can be built as a 1x8 or 4x2 in a single slot or as an 8K which takes up a double slot due to connector space needed.

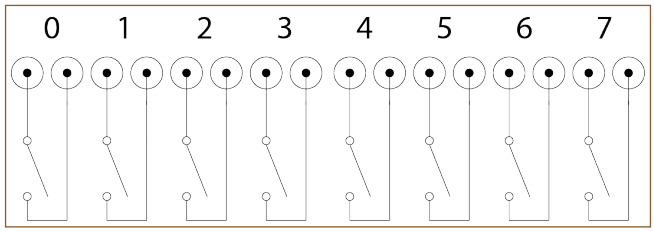


Fig. 4 HXV/8K-P Switch Module



BP- 3 Way Binding Post
(Banana Jack)
Connect with Banana plugs, wire through post hole, or clamp wire lead under thumbscrew. Easiest to wire but least safe since exposed.



SBP - Shrouded
Banana Jack
Safer Banana plug version. Also has slightly better isolation from ground and less AC capacitance.



SHV - Shielded
High Voltage
Offers the most protection and a shield that can be grounded but more expensive and hardest to wire.

RELAY SPECIFICATIONS

	HV Relays	Power Relays
Contact Rating	See Below**	3,000VA or 150 W DC
Switch Voltage	See Below**	380VAC or 250 VDC
Switch Current	See Below**	10 Amps
Carry Current	5.0 Amps	25 Amps
Breakdown Voltage	7500 V_{peak}	1,600 V_{peak}
Insulation Resistance	> 500 Gohms*	> 100 Gohms*
Operating Time	3.0 ms	15 ms
Life Expectancy (operations)		
Mechanical	100 million	10 Million
@ Rated Load	1 Million**	100 Thousand
Power consumption	0.84 Watts	0.24 Watts
RF Specs:		
Bandpass	DC to 50 MHz (individual modules)	
Isolation	>75 dB @ DC, 30 dB @ 50 MHz	
* Typical 1x8 configuration with SBP connectors		

** To maintain life expectancy Cytec does not recommend hot switching high voltage relays but has different relays available that will hot switch from 1000 to 3500 Volts, 50 to 200 Watts, and up to 3 amps. If you need to hot switch please contact Cytec for recommended relay based on the application.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in material or workmanship for a period of five years. Cytec does not void warranties for any reason other than intentional distructive misuse and customers are allowed to open or repair the boxes themselves.

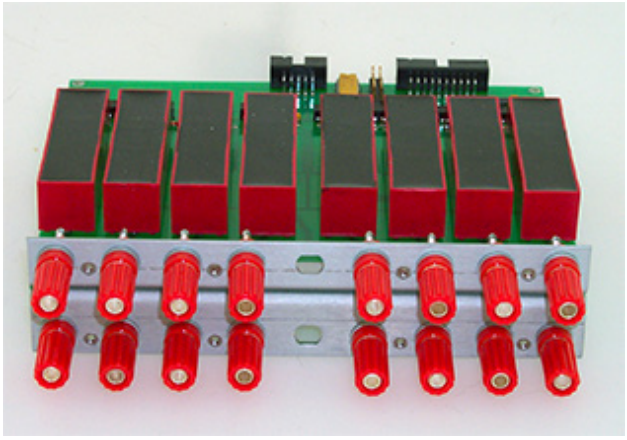
SOFTWARE

Cytec's newest control module comes with a browser based set-up screen to get started easily via LAN and allows you to operate the switch manually and store configurations using any browser.

Free drivers and/or sample programs are available for the most commonly available application programming languages. Go to cytec-ate.com/support for a list of programming examples and samples or contact sales@cytec-ate.com with a specific request.

National Instruments LabView Drivers
National Instruments LabWindows Drivers
Java, C, C++ code

Cytec's control commands consist of simple ascii text strings telling a relay to turn on or off. There are also commands which return the status of the current configuration to verify that the commands have been accepted. E-mail sales@cytec-ate.com for more information on control set-up and command structure.



HXV/8K-BP Module showing 16 connectors for eight discrete relays. This means the module takes up two normal panel slots which decreases the number of modules you can put in a standard chassis. Custom chassis can be built to mount any number of K modules needed.

DON'T SEE WHAT YOU NEED? CUSTOM SYSTEMS ARE AVAILABLE.

Options Include:

Custom Switch Modules

- RF connectors such as N type or BNC for high power low frequency applications.
- 1x2, 1x4 or 4K module configurations.
- Special relays for voltages above 5KV rms.

Custom Chassis Configurations

- Signal connections out front of chassis.
- Preconfigured 1xN or NxM wired systems.
- Large Matrix systems with separate drive.

CONTROL MODULES

IF-12 LAN / GPIB / RS232 Control
Cytec's newest control module has the three most popular control interface protocols built into one module and is backwards compatible with all previous Cytec control modules.

LAN - 10/100BaseT Ethernet with an RJ45 Connector.

GPIB - IEEE488.2 compliant control module.

RS232 - Standard D9 serial port which can be used from computer COM ports or USB to COM port cables

USB - A USB to RS232 Convertor can be provided to allow simple control through USB Ports.

MANUAL CONTROL OPTION

Manual Controls are available for all mainframe chassis.
HXV/32 Mainframes chassis can be purchased with an optional 32 channel pushbutton manual control PB/32.
HXV/96 and **HXV/128** mainframes can be built with optional MC-2 Keypad manual controls.

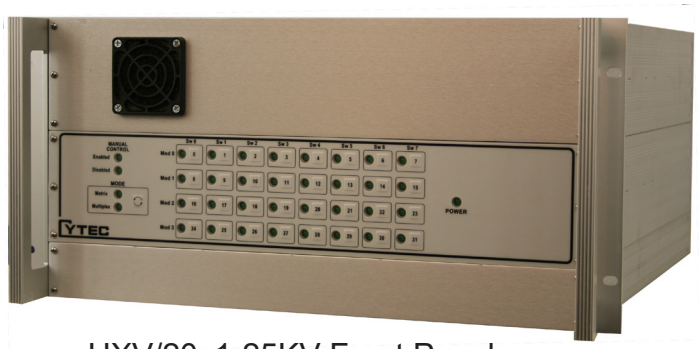
Programmable switching systems for automated test,
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25 KV HIGH VOLTAGE 20X1 MULTIPLEXER
Cytec Model HXV/20x1-25KV

FEATURES:

- 25,000 V Form C relays.
- 19" rack mount x 15" deep x 8.75" tall (5 RU).
- 20x1, Normally Open or Normally Closed configuration.
- Single wire common, multiwire x 20 connectors.
- 10/100 Ethernet LAN, GPIB and RS232 remote control.
- Full LED display & remote status feedback.
- Manual Control for use without computer control.
- Simple command set and addressing.
- Programming examples available in all popular languages.
- Five Year Warranty! • Field proven for 20 years.



HXV/20x1-25KV Front Panel



20x1 with LAN and RS232 Rear Panel

Other Features:

- Safety Interlock relay automatically disables relays.
- Common disconnect relay allows common grounding or charge dumps.
- Relays may be wired as Form A, Form B or Form C.
- High reliability Gigavac Relays.
- Ground lugs next to all connectors.
- Front panel manual control lockout from remote.
- Opto Isolated drives.
- See schematic on page 2 of bulletin.

SWITCH SPECIFICATIONS

Max Switched Voltage	25,000 V Peak
Max Carry Current	18 A continuous
Operating Time	15 ms
Life Expectancy	1 Million cycles cold switched 100,000 cycles at max power
Dimensions	19" rack mount Width, 20" Depth, 8.75" Height
Weight	35 lbs

Model HXV/20x1-25KV
$27,800.00 Complete

45 days ARO. Smaller and larger systems are available. Many other relay and connector types available. Custom systems with little to no NRE. Call or e-mail for quotes or technical help.

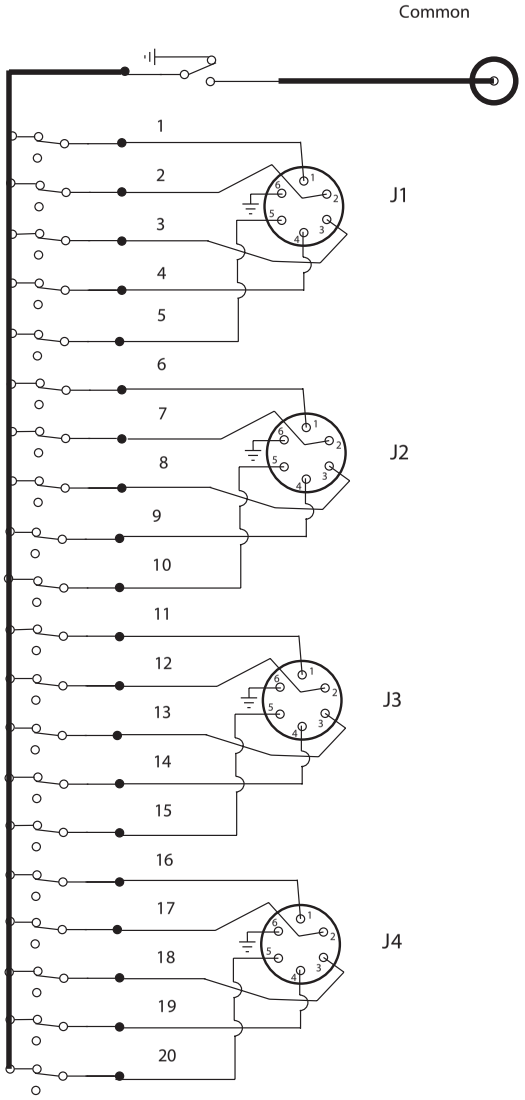
LabView, LabWindows and IVI drivers available.*
LabView and LabWindows are trademarks of National Instruments.

• View more of Cytec's HXV Series offerings.

• Contact Cytec at 1-585-381-4740 or sales@cytec-ate.com

Cytec
20x1 High Voltage Mux
with Charge Dump relay
on the common.
25KV Relays
Gigavac P/N G25-W-F
NC Position to Output connectors
Connector TE 859527-5
for 16 gage wire,
6 position.

Common connector
GES HB30 PTFE
Panel Mount Receptacle
P/N 7331051



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DRAWN BY: NNT
SIZE: C
TITLE: System Schematic
COMMENTS:
DRAWING NUMBER: 7434-00-91 Rev A

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