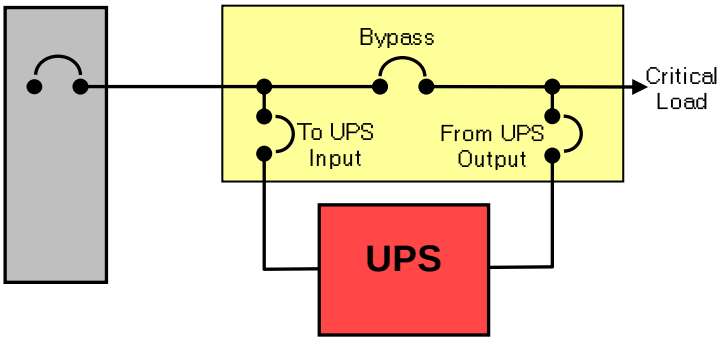
TECH CONNECT SYSTEMS

Keeping UPS *up!*

Why Electrical Engineers love the X-Switch UPS Bypass

Most UPS people hate to touch their UPS Bypass Switch. They never touch their bypass switch if they can help it. It's very emotional - you could blow up the UPS, drop the data center, and lose your job. No one wants to do it! And it's no wonder - UPS bypass switches are generally misleading, confusing, and dangerous!

Here's the most common UPS bypass, with 3 breakers:



Power normally flows through the "To UPS Input" breaker, then through the UPS, then through the "From UPS Output" breaker (often called the MIS or MIB), then to your critical load. The Bypass breaker is normally off.

When you need to service or replace the UPS you can send power to the critical load through the Bypass breaker. You can switch from UPS power to Bypass without dropping the critical load, *if you operate the breakers in the right order*. Great!

Several things make it hard to use most UPS Bypass Panels safely:

a. The breaker labels are cryptic: RIB, MBP, and MIS instead of plain words.
b. Some of the breakers work sideways and some work vertically. In a panic, it's confusing which way is on and which is off.
c. The instructions are confusing - they try to explain several different models of bypass switch using one generic instruction set. We also see missing instructions and wrong instructions. That's always exciting!
d. Here's the worst thing about most UPS Bypass Switches: If you have Kirk Keys with or without an SKRU (Solenoid Key Release Unit), the very presence of the keys makes you feel like you're protected against switching in the wrong order, and it's just not true. It's easy to switch in the wrong order, without using the SKRU or the keys at all. And it's very tempting!

There are two different disasters we're trying to prevent with the Kirk Keys and the SKRU:

Disaster A: If you turn off the "From UPS Output" breaker too soon, you drop your critical load. Ouch!
Disaster B: If you turn on the Bypass breaker too soon, you short Utility Power to the UPS Inverter. If the two power sources aren't synchronized, you can blow up your UPS *and* drop your critical load! Horrible!

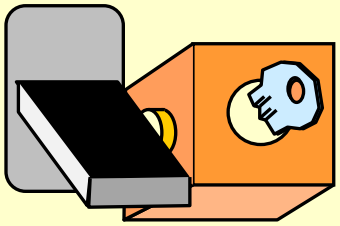
Bypass Switches are usually offered with two safety options: Kirk Keys alone, or Kirk Keys with an SKRU (Solenoid Key Release Unit). Everyone assumes that you get one safety feature with Kirk Keys alone, and you get two safety features with Kirk Keys plus the SKRU. This assumption is completely wrong! You actually get one safety feature with Kirk Keys, and *the other* safety feature with Kirk Keys + SKRU. They never offer both safety features together!

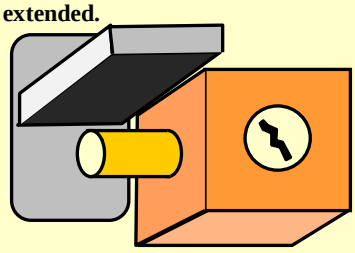
If you have Kirk Keys without the SKRU, you protect against Disaster A. The keys get installed *under* the breaker handles, as shown here. You can't turn off the "From UPS Output" breaker until you turn on the Bypass breaker, rotate the key and extend the shaft, then remove the key and use it to retract the shaft of the "From UPS Output" breaker. *Then* you can turn the "From UPS Output" breaker off.

UPS Bypass Breakers with Kirk Key Option
Kirk Key shafts extend *below* the breaker handles

Bypass Breaker is normally off, handle is down, KK shaft retracted.

"From UPS Output" breaker is normally on, handle is up, KK shaft extended.



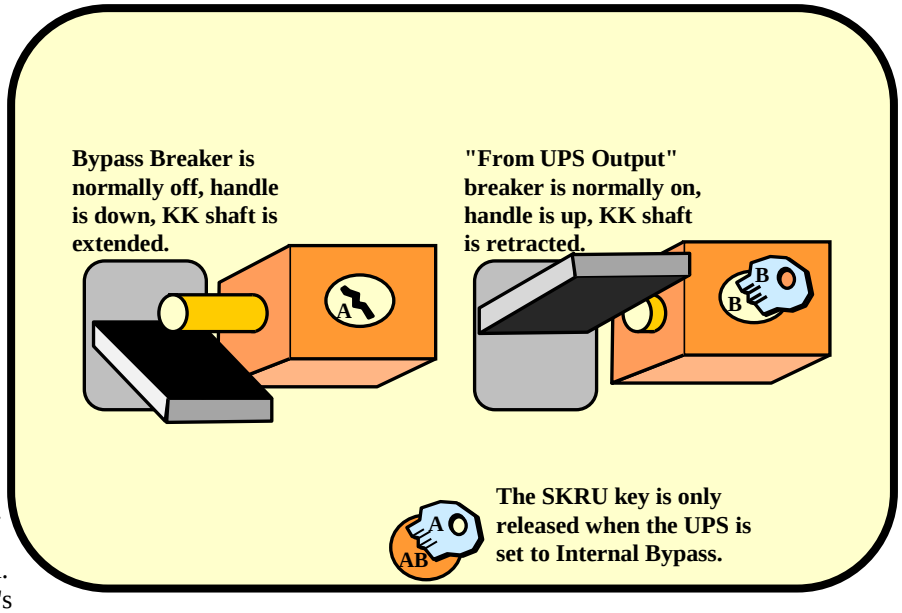


With this safety configuration, you're forced into Make-Before-Break operation so you don't accidentally drop the load. When you switch back to normal UPS operation, the keys again keep you from dropping the load.

BUT!! This configuration doesn't protect against Disaster B - anyone can turn on the Bypass Breaker at any time, without setting the UPS to Internal Bypass. Look at it - you can just turn it on - no keys needed, no nothing!

When you get a UPS Bypass Switch with Kirk Keys *and* SKRU, everyone assumes you'll still get the first safety feature, since there are still Kirk Keys in place. Here's the great misunderstanding - the Kirk Keys are now mounted in a different position and you protect against Disaster B, but you don't get *any* protection against Disaster A!

Here's what it looks like - the Kirk Keys mount *above* the breaker handles, and there's a separate SKRU key.



When you switch the UPS to Internal Bypass, the SKRU releases its key. You insert it into the Bypass KK slot A, retract the shaft, and turn on the Bypass breaker. Now you turn off the "From UPS Output" breaker and extend the KK shaft to lock it off, pull out Key B and store it in the SKRU key slot for later use.

This is great! It prevents Disaster B: you can't turn on the Bypass breaker while the UPS is still running on inverter, so you don't short UPS inverter power to the utility.

BUT!! This scheme can't prevent Disaster A. Look at the "From UPS Output" breaker - it's naked! Anyone can just walk up and turn it off, without using any keys or following any instructions, or anything else. Someone trying to bypass in a hurry or in a panic can just drop the critical load, without using the keys!

The whole bypass switch industry should be really embarrassed about this situation. They don't protect against both disasters!

We build **X-Switch**, the Premium UPS Bypass Switch, with these excellent features:

- Premium X-Switch safety systems prevent both Disasters A and B.
- All three breakers operate up and down, which is so much more intuitive. Up is on!
- Breakers are behind a closed door, not exposed to accidental or mischievous touching.
- Breaker labels are plain to understand, like "Bypass" instead of MBP, and "From UPS Output" instead of MIS.
- Instructions are clear and correct. Each different version of the X-Switch has its own specific instruction set.
- We attach a clear one line diagram, to help you understand how the X-Switch connects to your UPS.

X-Switch is the best! It takes the panic out of bypassing your UPS system. It's safer, friendlier, and more fool-proof than any other UPS bypass switch. Watch the 3 min. Safety Video at upsbypass.com, to see how we do it!

Engineers love the X-Switch because it really works right, and protects against both disasters. They also love our ability to add custom features. They've asked us for lots of variations including:

Transformers	Auxiliary Contacts	
Load Bank Breaker	High kAIC ratings	
Output Distribution Breakers	Double Lugs	**We can do every possible custom customization!**
Dual Source selection switch	Dual Input UPS - 4 Breakers	

New X-Switch products, now available:

a. Rotary X-Switch prevents both disasters, and is much simpler to operate. Smaller, too, and costs less!
b. Isolation Bypass X-Switch for any ATS. Wall mountable, much smaller and less expensive than other Isolation Bypass systems.

New Feature coming soon: Guiding Lights: LED's on the X-Switch show you which breaker to operate next. Nice!

See it all at upsbypass.com and call us for additional information - we're really friendly!

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