

Basic framework of uninterruptible power supply

Source: <https://aides-panneaux-solaire.fr/Thu-14-Sep-2023-26401.html>

Website: <https://aides-panneaux-solaire.fr>

This PDF is generated from: <https://aides-panneaux-solaire.fr/Thu-14-Sep-2023-26401.html>

Title: Basic framework of uninterruptible power supply

Generated on: 2026-03-15 02:19:54

Copyright (C) 2026 AIDES SOLAR. All rights reserved.

For the latest updates and more information, visit our website: <https://aides-panneaux-solaire.fr>

When high levels of power quality and dependability are required, UPS is a crucial component of the electrical infrastructure.

An Uninterruptible Power Supply Schematic represents the electrical blueprint of a system designed to provide immediate backup power when the primary power source fails. This ...

This article introduces the working principles of uninterruptible power supply, main types including standby (offline) UPS, line-interactive UPS, online (double-conversion) UPS, ...

Everything you ever wanted to know about uninterruptible power supplies but were afraid to ask. Budgeting for electricity, securing adequate supplies of it and finding ways to use less of it are ...

Figure below shows a simple static UPS schematic. The static uninterruptible power supply (SUPS) basically consists of four major blocks. They are the battery rectifier/charger, battery ...

The article provides an overview of how uninterruptible power supply (UPS) systems work, including their operating modes and key components.

Course Content
OPERATION
Normal Mode Operation
Upset Mode Conditions
Offline
2) Online Protection
UPS or Line Interactive UPS
3) Double conversion (On-line)
MAJOR COMPONENTS
CHARACTERISTICS
Rectifier
Inverter
Ferroresonant
Disadvantages
Transfer Switch
Design and Operation
Batteries
Battery Charger
STATIC UPS SYSTEM RATING & SIZE SELECTION
Determining load kVA and Power Factor
Determining load inrush kVA
TESTING
Battery supported Motor Generator (M-G) set
Rotary systems with a transfer switch to a bypass source
Paralleling of redundant rotary systems
MOTOR
Synchronous motors
DC motors
GENERATOR
SDC

generatorsExcitersAdvantages and disadvantages of rotary UPS systemsRotary DisadvantagesSELECTING AN UPSDetermine needDetermine the purpose Determine the power requirementsSelect the Type of UPSDetermine maintainabilityDetermine if affordableAn UPS system is an alternate or backup source of standby power with the electric utility company being the primary source. The UPS provides protection of load against line frequency variations, elimination of power line noise and voltage transients, voltage regulation, and uninterruptible power for critical loads during failures of normal utility ...See more on pdhonline Missing: frameworkMust include: frameworkol#b_results li.b_ad,ol#b_topw.b_results_eml li.b_ad,ol#b_topw li.b_ad{background-color:transparent;border-right:0;border-bottom:1px solid #ebebeb;margin-bottom:1px;padding-right:20px;padding-bottom:5px}ol#b_results li.b_adBottom,ol#b_topw.b_results_eml li.b_adBottom{border-top:1px solid #ebebeb;border-bottom:0;padding-bottom:0}ol#b_context li.b_ad,ol#b_rrat_cont li.b_ad{background-color:transparent}.sb_add cite{text-transform:lowercase}#b_results .b_ad .sb_adTA .b_caption,#b_topw.b_results_eml .b_ad .sb_adTA .b_caption,#b_results .b_ad .sb_adTA .b_vlist2col li,#b_topw.b_results_eml .b_ad .sb_adTA .b_vlist2col li,#b_results .b_ad .sb_adTA .b_factrow,#b_topw.b_results_eml .b_ad .sb_adTA .b_factrow,#b_results .b_ad .sb_adTA .b_bcfactrow,#b_topw.b_results_eml .b_ad .sb_adTA .b_bcfactrow,#b_topw .b_ad .sb_adTA .b_vlist2col li,#b_topw .b_ad .sb_adTA .b_factrow,#b_topw .b_ad .sb_adTA .b_bcfactrow{padding-bottom:var(--smtc-gap-between-content-xx-small)}#b_results .b_ad .sb_adTA .b_vlist2col,#b_topw.b_results_eml .b_ad .sb_adTA .b_vlist2col,#b_results .b_ad .sb_adTA .b_factrow,#b_topw.b_results_eml .b_ad .sb_adTA .b_factrow,#b_results .b_ad .sb_adTA .b_bcfactrow,#b_topw.b_results_eml .b_ad .sb_adTA .b_bcfactrow,#b_results .b_ad .sb_adig,#b_topw.b_results_eml .b_ad .sb_adig,#b_topw .b_ad .sb_adTA .b_vlist2col,#b_topw .b_ad .sb_adTA .b_factrow,#b_topw .b_ad .sb_adTA .b_bcfactrow,#b_topw .b_ad .sb_adig{margin-top:0}#b_results .b_ad h3.b_adlabel,#b_topw.b_results_eml .b_ad h3.b_adlabel,#b_topw .b_ad h3.b_adlabel{margin-bottom:var(--smtc-gap-between-content-xx-small)}.b_ad .pa_mlo~.sb_adt{margin-bottom:-6px}.b_ad_description{font:var(--bing-smtc-text-global-body3);color:var(--bing-ads-smtc-desktop-foreground-snippet-default)}#b_results .sb_add h2:hover a,#b_topw.b_results_eml .sb_add h2:hover a{text-decoration:underline}#b_results .sb_add h2:hover,#b_topw.b_results_eml .sb_add h2:hover{cursor:pointer}.b_ad li.b_adLastChild{margin-bottom:0}#b_results>li.b_ad{background-color:#fcfaf9} #b_topw.b_results_eml>li.b_ad{background-color:#fcfaf9} #b_context>li.b_ad{background-color:#fcfaf9} .b_dark #b_results>li.b_ad{background-color:inherit} .b_dark #b_topw.b_results_eml>li.b_ad{background-color:inherit}.pa_item .pa_img.white_bg,.pa_hover .pa_hover_img.white_bg{background-color:#f5f5f5}@media(forced-colors:none){.pa_item .pa_img.white_bg img,.pa_hover .pa_hover_img.white_bg img{mix-blend-mode:multiply}}#b_content .pa_carousel_mlo .b_slidebar .slide.see_more{width:85px!important;margin-right:0!important}#b_content .pa_carousel_mlo .see_more .carousel_seemore img.seeAll_chev.rms_img{opacity:0;padding-bottom:var(--smtc-gap-between-content-xx-small)}#b_content .pa_carousel_mlo .see_more .carousel_seemore

```

a.b_moreLink{position:relative;text-decoration-color:var(--bing-smtc-foreground-content-brand-rest)}#b_content
.pa_carousel_mlo .see_more .carousel_seemore
a.b_moreLink::before{content:"";position:absolute;width:48px;height:48px;top:var(--smtc-gap-between-content-medium);left:50%;-webkit-transform:translate(-50%,0);-moz-transform:translate(-50%,0);-ms-transform:translate(-50%,0);-o-transform:translate(-50%,0);transform:translate(-50%,0);background-color:var(--bing-smtc-background-card-on-primary-alt-pressed);border-radius:10px;opacity:0;-webkit-transition:opacity .1s ease;-moz-transition:opacity .1s ease;-ms-transition:opacity .1s ease;-o-transition:opacity .1s ease;transition:opacity .1s ease}#b_content .pa_carousel_mlo .see_more .carousel_seemore
a.b_moreLink:hover::before,#b_content .pa_carousel_mlo .see_more .carousel_seemore
a.b_moreLink:focus::before,#b_content .pa_carousel_mlo .see_more .carousel_seemore
a.b_moreLink:active::before{opacity:1}#b_content .pa_carousel_mlo .see_more .carousel_seemore
a.b_moreLink::after{content:"";position:absolute;width:13px;height:13px;bottom:var(--smtc-padding-content-xx-large);left:50%;border-style:solid;border-width:3px 3px 0 0;border-color:var(--bing-smtc-foreground-content-brand-rest);-webkit-transform:translate(-75%,-50%) rotate(45deg);-moz-transform:translate(-75%,-50%) rotate(45deg);-ms-transform:translate(-75%,-50%) rotate(45deg);-o-transform:translate(-75%,-50%) rotate(45deg);transform:translate(-75%,-50%) rotate(45deg);border-radius:2px}#b_content .pa_carousel_mlo .see_more .carousel_seemore a.b_moreLink
.seeAll_txt{color:var(--bing-smtc-foreground-content-brand-rest);font:var(--bing-smtc-text-global-body3-strong)}
.pa_carousel .b_slideexp{margin-bottom:0}
.pa_carousel .b_slideexp
.btn{z-index:8}
.pa_carousel_mlo{margin:0 calc(-1*var(--mai-smtc-padding-card-default));padding-bottom:var(--smtc-gap-between-content-xx-small)}
.b_adBottom .pa_carousel_mlo{margin:var(--mai-smtc-padding-card-default) 0 0 0!important}
.narrpole .pa_carousel_ml{padding-right:20px}
.pa_carousel_mlo.expanded .pa_carousel_ml{padding-right:var(--smtc-gap-between-content-xx-large)}
.pa_carousel_ml .slide{border-collapse:separate}
.pa_carousel_ml .slide.anim{visibility:hidden;animation:slideInFromLeft .05s cubic-bezier(.3,.5,.1,1) .3s 1 normal forwards}
@-webkit-keyframes slideInFromLeft{0%{visibility:visible;transform:translateX(100%)}100%{visibility:visible;transform:translateX(0)}}
@keyframes slideInFromLeft{0%{visibility:visible;transform:translateX(100%)}100%{visibility:visible;transform:translateX(0)}}
.pa_carousel_ml .slide:focus-visible{text-decoration:underline}
li.b_ad,#b_content ol#b_topw.b_results_eml
li.b_ad{border-bottom:0}
.b_adPATitle{text-overflow:ellipsis;overflow:hidden;white-space:nowrap;padding-right:var(--smtc-gap-between-content-medium);height:26px;font:var(--bing-smtc-text-global-subtitle1-strong);color:var(--smtc-foreground-content-neutral-primary)!important;padding-bottom:var(--smtc-padding-ctrl-sm-text-bottom)}
.b_adPATitleBlock{padding-bottom:var(--smtc-gap-between-content-small)}
.b_adPATitleBlock
.b_floatR{margin-left:var(--mai-smtc-padding-card-default)}
.b_adPATitle
a:focus-visible{margin-left:var(--smtc-padding-ctrl-text-side);text-decoration:underline}
.b_adPATitle
a{font:var(--bing-smtc-text-global-subtitle1-strong)!important;color:var(--smtc-foreground-content-neutral-primary)!important;vertical-align:text-bottom}
.pa_carousel_ml

```

```
.b_adPATitleBlock{padding-left:var(--mai-smtc-padding-card-default)}.b_adPATitle_chevron{display:inline-
flex;padding:var(--smtc-gap-inside-ctrl-to-secondary-icon)}.b_adPATitleBlock
.b_adSlug{margin-right:var(--bing-ads-smtc-url-icon-padding-left);padding:0
var(--smtc-padding-ctrl-text-side);border:1px solid
var(--bing-ads-smtc-ad-slug-stroke);font:var(--bing-smtc-text-global-caption2);color:var(--bing-ads-smtc-desk
top-foreground-ad-slug-default);border-radius:var(--bing-ads-smtc-ad-slug-corner)}.sb_adTA
.b_adSlug{font:var(--bing-smtc-text-global-caption2);line-height:var(--bing-ads-smtc-ad-slug-line-height);bor
der-radius:var(--bing-ads-smtc-ad-slug-corner);display:inline-block}.b_adSlug{font-size:11px;font-weight:nor
mal;line-height:11px;border-radius:6px;display:inline-block}.b_adSlug{color:var(--bing-ads-smtc-desktop-for
eground-ad-slug-default);border:1px solid
var(--bing-ads-smtc-ad-slug-stroke);vertical-align:middle}.sb_adTA .b_adSlug,.ba_results
.b_adSlug{color:var(--bing-ads-smtc-desktop-foreground-ad-slug-default);border:1px solid
var(--bing-ads-smtc-ad-slug-stroke)}#b_context>li.b_ad .sb_adBrandSidebar.sb_adTA
.b_adSlug>a,#b_rrat_cont>li.b_ad .sb_adBrandSidebar.sb_adTA
.b_adSlug>a{color:var(--bing-ads-smtc-desktop-foreground-ad-slug-default)}.b_adSlug{padding:0
var(--smtc-gap-between-content-xxx-small) 0
var(--smtc-gap-between-content-xxx-small)}.b_adSlug{margin-right:var(--smtc-gap-between-content-xx-smal
l)}.sb_adTA .b_adSlug,.ba_results
.b_adSlug{margin-right:var(--smtc-padding-ctrl-text-side)}z{a:1}z{a:1}z{a:1}.b_adChoice{position:relative;
width:12px;height:12px;text-indent:0;overflow:hidden;direction:ltr;transform:none;float:right}.b_adChoiceInl
ine{display:inline-block}.b_adChoice::after{transform-origin:-320px
0;transform:scale(.5);position:relative;display:inline-block}.b_adSlugRow
.b_adChoice{float:none;vertical-align:-1px;display:inline-block}.pa_sbo+a
.b_adChoice{margin-top:8px}.b_adPATitleBlock bubble_lite bubble_item,.b_adSlugRow bubble_lite
bubble_item,.b_spa_adblock bubble_lite bubble_item,.b_magazine bubble_lite
bubble_item,.ra_car_container bubble_lite
bubble_item,.b_adinfo{display:inline-block!important}.b_adinfo{cursor:pointer;vertical-align:middle;line-hei
ght:0}.b_adChoice::after{content:url(/rp/EX_mgILPdYtFnI-37m1pZn5YKII.png)}.emb_ppa
.listad{position:relative}.emb_ppa .b_adinfo bubble_item{height:12px}.emb_ppa lcard .lc_content
.b_factrow .b_slgw{position:absolute;top:6px;left:8px;display:flex;align-items:center;border:1px solid
#ecec;border-radius:6px;background-color:#fff;justify-content:center;height:20px;width:71px}div.b_adSlug
, lcard .lc_content .b_factrow div.b_embPPASlug.b_adSlug,#IMapContainer .b_aswta .vertcard .lc_content
div.b_factrow div.b_adSlug,div.gs_VA_slgw .b_adSlug.b_opttxt.b_divdef,.genserp_PA_container
.genserp_PA_title div.genserp_PA_adslug
span.genserp_adSlug,.gs_embedded_label_container,.embedded_msan_ad_slug{border:0;margin-right:0}#b_c
ontent .pa_carousel_mlo .pa_item.pa_vCard .pa_title,#b_content .pa_carousel_mlo .pa_item.pa_vCard
.pa_caption,#b_content .pa_carousel_mlo .pa_item.pa_vCard .b_finalText,#b_content .pa_carousel
.pa_item.pa_vCard .pa_title,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption,#b_content .pa_carousel
.pa_item.pa_vCard .b_finalText,#b_content .pa_grid .pa_item.pa_vCard .pa_title,#b_content .pa_grid
```

.pa_item.pa_vCard .pa_caption,#b_context .pa_grid .pa_item.pa_vCard .b_finalText{padding:0
var(--smtc-padding-ctrl-horizontal-default)}#b_content .pa_carousel_mlo .pa_item.pa_vCard .cico,#b_content
.pa_carousel .pa_item.pa_vCard .cico,#b_context .pa_grid .pa_item.pa_vCard
.cico{margin-bottom:var(--smtc-gap-between-content-small)}#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_title,#b_content .pa_carousel .pa_item.pa_vCard .pa_title,#b_context .pa_grid
.pa_item.pa_vCard
.pa_title{font:var(--bing-smtc-text-global-body3);color:var(--smtc-ctrl-link-foreground-brand-rest)}#b_content
t .pa_carousel_mlo .pa_item.pa_vCard .pa_caption,#b_content .pa_carousel .pa_item.pa_vCard
.pa_caption,#b_context .pa_grid .pa_item.pa_vCard
.pa_caption{margin-top:var(--smtc-gap-between-content-x-small);padding-bottom:var(--smtc-gap-between-co
ntent-x-small);font:var(--bing-smtc-text-global-caption1)!important}#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_caption .pa_price,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption
.pa_price,#b_context .pa_grid .pa_item.pa_vCard .pa_caption
.pa_price{margin-bottom:var(--smtc-gap-between-content-xx-small)}#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_caption .pa_price .prc_clr_grn,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption
.pa_price .prc_clr_grn,#b_context .pa_grid .pa_item.pa_vCard .pa_caption .pa_price
.prc_clr_grn{color:var(--smtc-status-success-tint-foreground)}#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_caption .pa_price strong,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption
.pa_price strong,#b_context .pa_grid .pa_item.pa_vCard .pa_caption .pa_price
strong{color:var(--smtc-foreground-content-neutral-primary)}#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_caption .pa_price .original_price,#b_content .pa_carousel .pa_item.pa_vCard
.pa_caption .pa_price .original_price,#b_context .pa_grid .pa_item.pa_vCard .pa_caption .pa_price
.original_price{font:var(--bing-smtc-text-global-caption1);padding-left:var(--smtc-gap-between-content-x-sma
ll)}#b_content .pa_carousel_mlo .pa_item.pa_vCard .pa_caption .pa_installmentDesc,#b_content
.pa_carousel_mlo .pa_item.pa_vCard .pa_caption .pa_unitprice,#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_caption .vertical_converted_price,#b_content .pa_carousel_mlo .pa_item.pa_vCard
.pa_caption .pa_shippingcost,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption
.pa_installmentDesc,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption .pa_unitprice,#b_content
.pa_carousel .pa_item.pa_vCard .pa_caption .vertical_converted_price,#b_content .pa_carousel
.pa_item.pa_vCard .pa_caption .pa_shippingcost,#b_context .pa_grid .pa_item.pa_vCard .pa_caption
.pa_installmentDesc,#b_context .pa_grid .pa_item.pa_vCard .pa_caption .pa_unitprice,#b_context .pa_grid
.pa_item.pa_vCard .pa_caption .vertical_converted_price,#b_context .pa_grid .pa_item.pa_vCard .pa_caption
.pa_shippingcost{font:var(--bing-smtc-text-global-caption1);margin-bottom:var(--smtc-gap-between-content-
xx-small);color:var(--bing-smtc-foreground-content-neutral-secondary-alt)}#b_content .pa_carousel_mlo
.pa_item.pa_vCard .pa_caption .b_attribution,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption
.b_attribution,#b_context .pa_grid .pa_item.pa_vCard .pa_caption
.b_attribution{margin-bottom:var(--smtc-gap-between-content-xx-small);color:var(--bing-smtc-foreground-co
ntent-neutral-secondary-alt);border-bottom:0;font:var(--bing-smtc-text-global-caption1)}#b_content
.pa_carousel_mlo .pa_item.pa_vCard .pa_caption .b_attribution cite,#b_content .pa_carousel

```
.pa_item.pa_vCard .pa_caption .b_attribution cite,#b_context .pa_grid .pa_item.pa_vCard .pa_caption
.b_attribution
cite{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutral-secondary-al
t);opacity:unset}#b_content .pa_carousel_mlo .pa_item.pa_vCard .pa_caption .b_secondaryText,#b_content
.pa_carousel .pa_item.pa_vCard .pa_caption .b_secondaryText,#b_context .pa_grid .pa_item.pa_vCard
.pa_caption
.b_secondaryText{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutra
l-secondary-alt)}#b_content .pa_carousel_mlo .pa_item.pa_vCard .pa_caption .b_secondaryText
.pa_rebateText,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption .b_secondaryText
.pa_rebateText,#b_context .pa_grid .pa_item.pa_vCard .pa_caption .b_secondaryText
.pa_rebateText{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutral-s
econdary-alt)}#b_content .pa_carousel_mlo .pa_item.pa_vCard .pa_caption .b_secondaryText .pa_promo
a,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption .b_secondaryText .pa_promo a,#b_context .pa_grid
.pa_item.pa_vCard .pa_caption .b_secondaryText .pa_promo
a{color:var(--smtc-ctrl-link-foreground-brand-rest)}#b_content .pa_carousel_mlo .pa_item.pa_vCard
.pa_caption .b_secondaryText .pa_rating a,#b_content .pa_carousel .pa_item.pa_vCard .pa_caption
.b_secondaryText .pa_rating a,#b_context .pa_grid .pa_item.pa_vCard .pa_caption .b_secondaryText
.pa_rating a{color:var(--bing-smtc-foreground-content-neutral-secondary-alt)}#b_content .pa_carousel_mlo
.b_overlay .btn .cr{height:24px;width:20px;padding:var(--smtc-padding-ctrl-lg-text-top)
var(--smtc-padding-ctrl-sm-horizontal-default);background-color:var(--bing-smtc-foreground-ctrl-on-image-s
witchable-rest);border-radius:var(--smtc-corner-ctrl-lg-rest);box-shadow:var(--acf-elevation-3)}#b_content
.pa_carousel_mlo .b_overlay .btn
.cr>div{width:8px;height:8px;background-color:transparent;border-color:var(--smtc-foreground-content-neutr
al-primary);border-style:solid;border-width:2px 2px 0
0;transform:rotate(45deg);border-radius:0;top:var(--smtc-padding-ctrl-text-top);left:var(--smtc-padding-ctrl-s
m-text-top);position:relative;box-shadow:none;margin:0}#b_content .pa_carousel_mlo .b_overlay .btn
.cr>div::after{content:"";display:none}#b_content .pa_carousel_mlo .b_overlay
.btn.next{margin-right:6px}#b_content .pa_carousel_mlo .b_slideexp
.b_hoverFading{background:linear-gradient(90deg,var(--bing-smtc-background-ctrl-fade-on-primary-stop-0)
0%,var(--smtc-background-card-on-primary-default-rest) 60%);right:0}#b_content .pa_carousel_mlo
.b_slidesContainer{width:100%}html[dir="rtl"] #b_content .pa_carousel_mlo .b_overlay .btn
.cr>div{transform:rotate(135deg);left:calc(-1*var(--smtc-padding-ctrl-sm-text-top))}html[dir="rtl"]
#b_content .pa_carousel_mlo .b_slideexp
.b_hoverFading{background:linear-gradient(270deg,var(--bing-smtc-background-ctrl-fade-on-primary-stop-0)
0%,var(--smtc-background-card-on-primary-default-rest) 60%)}#b_content .pa_carousel_mlo
.slide,#b_content .pa_carousel .slide,#b_context .pa_grid
.pa_item{border-radius:var(--smtc-corner-card-rest)!important}#b_pole
.pa_carousel_mlo{margin-right:0}.pa_item.pa_vCard{word-wrap:break-word;line-height:20px;overflow:hidd
en}.pa_item.pa_vCard p strong,.pa_item.pa_vCard .pa_price strong{color:#111}.pa_item.pa_vCard
```

```
.pa_deal{text-decoration:line-through}#b_content .pa_item.pa_vCard
.b_attribution{font-size:14px;padding-bottom:0;line-height:20px}#b_context .pa_item.pa_vCard
p,#b_rrat_cont .pa_item.pa_vCard p{line-height:20px}#b_content .pa_item.pa_vCard
.pa_title{line-height:20px;overflow:hidden}.pa_item.pa_vCard
.b_footnote{line-height:17px;padding-bottom:0}.pa_item.pa_vCard
.pa_caption{padding-bottom:8px}.pa_item.pa_vCard .pa_caption,.pa_item.pa_vCard
.pa_title{padding-left:4px;padding-right:4px}.pa_item.pa_vCard
.b_finalText{position:absolute;width:100%;box-sizing:border-box;left:0;padding:0 4px 0
4px;bottom:8px}.pa_item.pa_vCard
.cico{display:block;padding-bottom:0;margin-bottom:8px;margin-left:auto;margin-right:auto;border-radius:0}
.pa_item.pa_vCard .pa_img{position:relative}.pa_item.pa_vCard .pa_price:hover,.pa_item.pa_vCard
.b_attribution:hover,.pa_item.pa_vCard .b_footnote:hover{cursor:pointer}.pa_carousel .slide{box-shadow:0 0
0 1px rgba(0,0,0,.1)!important}.pa_carousel .slide.see_more{box-shadow:0 0 0 0
rgba(0,0,0,0)!important}.pa_caption .pa_price:hover strong,.pa_hover .pa_hover_content .pa_price:hover
strong{text-decoration:underline;text-decoration-color:#111}.pa_caption .b_attribution:hover,.pa_hover
.pa_hover_content
.b_attribution:hover{text-decoration:underline}.pa_caption>.b_secondaryText:hover,.pa_hover
.pa_hover_content>.b_secondaryText:hover{color:#444}.b_ads1line{white-space:nowrap;overflow:hidden;te
xt-overflow:ellipsis;display:block}.pa_item .b_attribution cite,#b_context .pa_item .b_attribution
cite,.pa_hover .b_attribution cite,.pa_item .b_footnote .pa_url cite,#b_rrat_cont .pa_item .b_attribution
cite{color:#111;opacity:.8}#bpage.b_drk .pa_item .b_footnote .pa_url
cite{color:#d2d0ce}.pa_item.pa_vCard{cursor:pointer}@supports(-webkit-line-clamp:2){.b_adsTrunTx{displ
ay:-webkit-box;overflow:hidden;-webkit-box-orient:vertical;white-space:normal;visibility:visible}.b_ellipsis{
display:none}.b_adsTrunTx
.b_hiddenTx{display:inline}}.b_hiddenTx{display:none}.pa_item.pa_vCard,.pa_item.pa_hCard{position:relat
ive}.pa_hover{z-index:4}.pa_carousel .b_overlay .btn{z-index:5!important}.pa_item.pa_vCard
.pa_newtab_icon{display:none}.pa_item.pa_vCard .pa_newtab_icon,.pa_item.pa_hCard:hover
.pa_newtab_icon,.pa_hover
.pa_newtab_icon{position:absolute;background-color:rgba(0,0,0,.35);background-size:10px
10px;background-position:4px
4px;background-repeat:no-repeat;border-radius:var(--smtc-corner-circular);height:18px;width:18px;z-index:1
}.pa_item.pa_vCard .pa_newtab_icon,.pa_hover
.pa_newtab_icon{right:4px;top:4px}.pa_item.pa_hCard:hover
.pa_newtab_icon{left:110px;top:8px}.pa_item.pa_vCard .pa_newtab_icon,.pa_item.pa_hCard:hover
.pa_newtab_icon,.pa_hover
.pa_newtab_icon{background-image:url(
AAAUCAYAAACNiR0NAAAAA0kIEQVQ4EWNgGOyAkVIH/v//3xBoBg+15sD1Aw08DcRwAJcglwE0iRu
I58FMZAQyTICGFZNoYBcjI+N5kB6g/kIAKg2I24G4gQVISANxOBAvBWJiwDEshgUBNV4HYhWQDf5
A/JsYk5DVgFwGxD+A2AtZnCwDgYaUYjUMZDJQgmQXAvUIA7EjVD8nk00McyUTjEEKDQzDt0C8H
```

6pnPpC2hekny0CYZiitjMynhoHI5jEMfgNBCRsEQDnGH8IkRRRA1gEy8D8Ur0GWIJH9l0T1w0k5AETBd
SUE2utkAAAAEIFTkSuQmCC)}.pa_rating { white-space: nowrap; text-overflow: ellipsis; min-height: 17px } #b
_results .pa_item .pa_ratingssmaller>span, #b_topw.b_results_eml .pa_item
.pa_ratingssmaller>span { transform: translateZ(0) } #b_results .pa_item .pa_ratingssmaller .sw_st, #b_results
.pa_item .pa_ratingssmaller .sw_sth, #b_results .pa_item .pa_ratingssmaller .sw_ste, #b_topw.b_results_eml
.pa_item .pa_ratingssmaller .sw_st, #b_topw.b_results_eml .pa_item .pa_ratingssmaller
.sw_sth, #b_topw.b_results_eml .pa_item .pa_ratingssmaller .sw_ste { transform: scale(calc(10/12)); margin: -1px
-2px -1px -1px } .pa_hover .pa_rating
.rms_img { display: inline-block; margin-bottom: 0; margin-left: 0; margin-right: 0 } #b_content .b_ad
.b_secondaryText .b_colorBlend, #b_results>.b_ad .b_colorBlend, #b_topw.b_results_eml>.b_ad
.b_colorBlend, #b_results>.b_ad .b_accentColor, #b_context>.b_ad .b_accentColor, #b_rrat_cont>.b_ad
.b_accentColor, #b_topw.b_results_eml>.b_ad .b_accentColor, #b_context>.b_ad
.b_colorBlend, #b_rrat_cont>.b_ad .b_colorBlend, #b_dynRail>.b_ad .b_colorBlend, .pa_hover
.b_secondaryText .b_colorBlend, #b_pole .pa_carousel .b_secondaryText
.b_colorBlend { color: var(--bing-ads-smtc-desktop-foreground-snippet-default) } .b_ad .csrc, .pa_item
.csrc { padding-right: 0 } .csrc .sw_rtc_color { color: #d32f2f; font-weight: bold; font-family: "Segoe
UI", Arial, Helvetica, Sans-Serif } .b_dark .csrc .sw_rtc_color { color: #f66 } .csrc .sw_rtright { padding-left: 5px } .csrc
.sw_rtleft { padding-right: 5px } .csrc .nobg { background-image: none } .csrc
.rms_st { padding-right: 1px; vertical-align: inherit; max-height: 14px; max-width: 14px } .b_secondaryText
.pa_targ { line-height: 20px } .pa_ml .pa_targ img.pa_targImage, .pa_sb .pa_targ
img.pa_targImage { float: left; margin: 2px 2px 0 0 } .pa_targ .pa_tgt_icon { display: inline-block; margin: 3px 2px 0
0; width: 12px; height: 12px } .pa_targ
.pa_shipping_icon { background-image: url("
wAAAAMCAYAAABWdVznAAAA1UIEQVR4AY1S0Q2CMBC9Fj74ZATZQE dwAzCQvwlQJ9ANbCAkF
OIkjuAKjNBvEqjviJhKjOkITdt37/Ve7iryPFdCiAsRxfQjrLXnuq71cg9Bvg3DkLRt26/JSqnNNE1PHD8CKor
C0p/gPC92wndJHiGITOCkRMXYS6C17rF1sFeGPgLHtvESVUIFqGXJTFmCuhAyu3lkuM4XpumuTsYZV
l2ZiZPAokHElvMYhdFETI9T4HtFwycDkM8yCAITquq5r27kzcgG35AOJbm7wFLyrH0hTH3BREqamOtXf
Q1AAAAEIFTkSuQmCC") } .b_dark .pa_targ
.pa_shipping_icon { background-image: url("
wAAAANCAyAAACdKY9CAAAACXBIWXMAAAAsTAAALEwEAmpwYAAAAAXNSR0IArs4c6QAA
AARnQU1BAACxjwv8YQUAAADXSURBVHgBjZHBdYJAEV3Re6WsCVI4MINKzF2oBVQgnaAVqB
UwJEDECyBEvZMAuv/BBIkYnYSMsObmZ0/u7Kua9X3/VGsWNU2jzAMm+l/g+LMGKNW6pXrus8vUpa
lEX+M+aq4jzP1TBB2BknJdYNvu+f6IuiKwaKALOSyljW0kCxW+4yGrpebxlgLfYdV3Ht9CO46Se5+kZG/
JkjCIJI8G73mNsNMYCPhnZnYxNgzRsfga8BkEglxIWjEvfJpAR4OMpDQpPv9gkiScd0J0ifGGHyxqjfQCw/
XdSIXPndwAAAABJRU5ErkJggg==") } .pa_targ
.pa_pricedrop_icon { background-image: url("
wAAAAMCAYAAABWdVznAAAACXBIWXMAAA7DAAAOwwHHb6hkAAAAGXRFWHRTb2Z0d2Fy
ZQB3d3cuaW5rc2NhcGUub3Jnm+48GgAAANRjREFUKJG1jz9KA1EQh795llbZiWScWFj6WCGFOYal1b
A77xWewQO8d4EUkmyhYBAtt7HaxcYz2OQUOzYupFASEH/VMHzf/IF/T13XG1WdHco759wj0MYyTW

FCCCeQ2lZVdfaTcNR13Yf3fgvcl2X5aWYr4E1E7rz3bd/32xFW1RcHkHNem1kwsyVwm1KqgBsReQ0hnO8smLuxyjk/FEUxSSk1ACmlDXBtZs8xxouRk31Pxhgvh2FogCvgaa/wfftCRBozm/wqqOo7MN1pHR8y/O/5A hF8R3I2zwNWAAAAAEIFTkSuQmCC")}.b_dark .pa_targ

.pa_pricedrop_icon{background-image:url(" AARnQU1BAACxjwv8YQUAAACHSURBVHgBtU/LDYAgDKWdxBFMSNjDEZxE3cQN3INAdANWcA HANpGEkIBe6KWlvF+F6F7GmFNrPf7FYwhhRsQjkbTiKuJQAIxicYVAFbqW4xxIbFJKXVlaRzywEv+Z LD3fpJS7vzOnd8aoJU3OScncohNQkmifn4Sihvrkay1jg4fivUtutcdZ+xS9rwRsT8AAAAASUVORK5CYII=')}.pa_targ

.pa_topview_icon{background-image:url(" AAAAMCAYAAABWdVznAAAACXBIWXMAAA7DAAAOwwHHb6hkAAAAGXRFWHRTb2Z0d2FyZ QB3d3cuaW5rc2NhcGUub3Jnm+48GgAAATRjREFUKJG1kb9KQmEcht/fpyK22FQkFA0NQVptEVTSDb Q5tLR1hurwSRLR5g2o8H0idO6ipJuItv6NDIEkhdEUBzy/t6UhoSWiZ3uHZ3le4L+R78NaOwNgS1VnAUB Eeul0+rzZbD6MCEEQjOVyuSbJXQDXAG5FREguACiKyKkxptZqtT5MvV5PZ7PZC5LrqrinFtW1SMRqT nnlkiuktXmkqRbqVRSZjAYnIjIXCaTKbfb7aswDCNjzKOqPllrO977S5IbAOYLhcKxEZEDknuNRuM1DM OyiGynUqmiqu6S3LHWrnvXwDskzw0cRyXvPddADDGTAAAY5PP5+36/fwfgDcAkADjnzobDYXGkUrVa HVfVGwA9AibkdBzHpSiK3n/M+iVNqWpAkkmSRJ1O5/mv3/2OT2YVjsqITb0WAAAAAEIFTkSuQmCC')}.b_dark .pa_targ

.pa_topview_icon{background-image:url(" AAAAMCAYAAABWdVznAAAACXBIWXMAAAAsTAAALEwEAmpwYAAAAAXNSR0IArs4c6QAA AARnQU1BAACxjwv8YQUAAADrSURBVHgBxZDNDYJAEIV3I5BwtAOxAyBAwk0rUCswVqAt2IEdaAd qBeqJhF870BI48+t7iRouHo2TvOxk5ps3A0L8OuQ7yfN8UNf1Wiml6LrOfJVvVFVvmyAIHp+BKIosgOcX cETOV2BwBK2QDtq2nfu+f1NwNgILKbeu6040TTsBmlFIWV5Qs9HbkwnD0JRjktD5gcaSw3A6A+b6ArJg YCOKNE13PFVxNW/k2zSNhaLgJmgOZ9am7GEDmUL2/0Acx2NABxjYhmeQzghOHMe5vhnVH/A878J 7dV2/A74jP/bhr8FvybJsKP4ST5cvd6Jdk9MJAAAAAEIFTkSuQmCC")}.pa_targ

.pa_condition_icon{background-image:url(" wAAAAAMCAYAAABWdVznAAAACXBIWXMAAA7DAAAOwwHHb6hkAAAAGXRFWHRTb2Z0d2Fy ZQB3d3cuaW5rc2NhcGUub3Jnm+48GgAAARpJREFUKJF1jzFKA1EQhr+ZtwewsRDFC3gCSSFY6BUCS TzBew+jKa0FQRd2wzZ2FjaidjZBEMTGSq8QvIPd27EwK5vFTDfzz//PflCiYowfiYS97lxXGUQkqOqd936 /Pc8AxuPxZkopBw6ANQAz+01UvQU2/gwhhK2U0ruIVM65SZ7nXwDe+55z7rGu69HixVcRGWbApYhU RVGcL/2qeg0Mp9Pp8+LiE3CVichhSumky1CW5U67TyndZF12pgvAlfBNOecSIARmGEEjeO97McbPrkFVj4 BZZmanInIPXDSgwLBZDCGsi8jIzCaquivtIbJjHNjuhH+b2ayu6+OqquZZWxGRAfBgZv2yLF/+Y1mCLYri zcz6QLUK/gcay2Kj1EE/gwAAAABJRu5ErkJggg==")}.b_dark .pa_targ

.pa_condition_icon{background-image:url(" wAAAAOCAyAAAAbvf3sAAAACXBIWXMAAAAsTAAALEwEAmpwYAAAAAXNSR0IArs4c6QAAAA RnQU1BAACxjwv8YQUAAADwSURBVHgBrVHbDYJAEOR4/GMH2IEXCAI12IFUoCVoBcYKKEE70D 8SAjk6kBL85+VMAgYukS82gWV3Z4e5OcNYK/I8V1mW7fS++W+h67rYNM27vmTzpZTy2rZN8MmhO 2PEEtL2Vw9gJYR4WZa1DYJA8MEfJHoV8n6Q+EzT1LMBvqI++75/05gTzPZhGJasSeg4TiKw2YN5I6X8 GAsBJS4I3jz0iIAlIwslD7HDl2hpTqyaZoD0sOGnHhw6EIw6ju1T6UAFmIZjnVdSzFIKYri3fe9p5FTcglwH

```
EVRZU8nZKbvtHJ0R4/ZTRNEMC011oovCux/EdBOneMAAAAASUVORK5CYII=")}.pa_targ
.rms_img,.pa_targ_text{vertical-align:top}.pa_hov_border
.pa_targ_longtext{font-size:12px;line-height:14px}.pa_hover{background-color:var(--smtc-background-web-
page-primary);box-shadow:none;position:absolute;opacity:0;visibility:hidden;word-wrap:break-word;cursor:p
ointer;overflow:hidden;z-index:4;pointer-events:none}.pa_hover
.pa_hover_content{padding-bottom:var(--smtc-gap-between-content-x-small)}.pa_hover
.pa_hover_title,.pa_hover .pa_price,.pa_hover .b_attribution,.pa_hover .b_secondaryText,.pa_hover
.pa_additionTx,.pa_hover>div>.b_ads1line,.pa_hover .b_footnote,.pa_hover
.pa_hover_content>.pa_locInv{padding-left:var(--smtc-padding-ctrl-horizontal-default);padding-right:var(--s
mtc-padding-ctrl-horizontal-default)}.pa_hover .pa_hover_img{position:relative}.pa_hover .pa_hover_img
img{display:block;margin-left:auto;margin-right:auto}.pa_hover
.pa_hover_title{font:var(--bing-smtc-text-global-body3)!important;color:var(--smtc-ctrl-link-foreground-bran
d-rest);margin-bottom:var(--smtc-gap-between-content-x-small)}.pa_hover
.pa_hover_title:hover{text-decoration:underline}.pa_hover
.pa_price{margin-bottom:var(--smtc-gap-between-content-xx-small)}.pa_hover .pa_price
.prc_clr_grn{color:var(--smtc-status-success-tint-foreground)}.pa_hover .pa_price
strong{color:var(--smtc-foreground-content-neutral-primary);font:var(--bing-smtc-text-global-caption1-strong
)}.pa_hover .pa_price
.original_price{font:var(--bing-smtc-text-global-caption1);padding-left:var(--smtc-gap-between-content-x-sma
ll)}.pa_hover .pa_installmentDesc,.pa_hover .pa_unitprice,.pa_hover .vertical_converted_price,.pa_hover
.pa_shippingcost{font:var(--bing-smtc-text-global-caption1);margin-bottom:var(--smtc-gap-between-content-
xx-small);color:var(--bing-smtc-foreground-content-neutral-secondary-alt);padding-bottom:0}.pa_hover
.b_attribution{margin-bottom:var(--smtc-gap-between-content-xx-small);color:var(--bing-smtc-foreground-co
ntent-neutral-secondary-alt);border-bottom:0;font:var(--bing-smtc-text-global-caption1)}.pa_hover
.b_attribution
cite{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutral-secondary-al
t);opacity:unset}.pa_hover .pa_bcSeparator{margin:var(--smtc-gap-between-content-xx-small)
0;border-top:1px solid #ecec}.pa_hover
.b_secondaryText{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutra
l-secondary-alt)}.pa_hover .b_secondaryText
.pa_rebateText{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutral-s
econdary-alt)}.pa_hover .b_secondaryText .pa_promo
a{color:var(--smtc-ctrl-link-foreground-brand-rest)}.pa_hover .b_secondaryText .pa_rating
a{color:var(--bing-smtc-foreground-content-neutral-secondary-alt)}.pa_hover .b_secondaryText
.b_colorBlend{color:var(--bing-smtc-foreground-content-neutral-secondary-alt)!important}.pa_hover
.pa_additionTx,.pa_hover
.pa_locInv{font:var(--bing-smtc-text-global-caption1);color:var(--bing-smtc-foreground-content-neutral-secon
dary-alt)}a.pa_hover_adLink:hover{text-decoration:none}.pa_hover:has(.pa_hover_content.pa_hcgp){border-
radius:var(--smtc-corner-card-rest)}.pa_hover.ad_scpah.pa_animation{background-color:var(--smtc-backgrou
```

```
nd-card-on-primary-default-hover);box-shadow:var(--acf-elevation-3);pointer-events:auto}.pa_item.pa_vCard
>a: hover{ text-decoration:none}.pa_hover: not(:has(.b_pa_hov_indicator_c)).pa_hover_img
img{ margin-bottom:var(--smtc-gap-between-content-small)}.pa_hover.ad_scpah.pa_animation{ transition:heig
ht var(--acf-animation-duration-default) var(--acf-animation-ease-default),background-color
var(--acf-animation-duration-default) var(--acf-animation-ease-default),box-shadow
var(--acf-animation-duration-default) var(--acf-animation-ease-default)}.b_slideexp
.b_hoverFading{ background:linear-gradient(90deg,rgba(255,255,255,.4) 0%,#fff
80%);position:absolute;top:0;right:-40px;width:40px;height:100%}.b_dark
.b_hoverFading{ background:linear-gradient(90deg,rgba(27,26,25,.4) 0%,#fff
80%)}.b_slideexp.hoverFading: hover .b_overlay>div:nth-child(3){ width:calc(100%
+ 40px)}#slideexp1_F921D1 .slide { width: 140px; margin-right: 16px; }#slideexp1_F921D1c .b_slidebar .slide
{ border-radius: 6px; }#slideexp1_F921D1 .slide:last-child { margin-right: 1px; }#slideexp1_F921D1c {
margin: -4px; } #slideexp1_F921D1c .b_viewport { padding: 4px 1px 4px 1px; margin: 0 3px; }
#slideexp1_F921D1c .b_slidebar .slide { box-shadow: 0 0 0 1px rgba(0, 0, 0, 0.05); -webkit-box-shadow: 0 0
0 1px rgba(0, 0, 0, 0.05); } #slideexp1_F921D1c .b_slidebar .slide.see_more { box-shadow: 0 0 0 0px rgba(0,
0, 0, 0.00); -webkit-box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); } #slideexp1_F921D1c .b_slidebar
.slide.see_more .carousel_seemore { border: 0px; }#slideexp1_F921D1c .b_slidebar .slide.see_more: hover {
box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); -webkit-box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); }Sponsored
```

This uninterruptible power supply book provides a comprehensive overview of UPS systems, encompassing their fundamental principles, diverse architectures, advanced control strategies, ...

Its aim is to introduce core sector themes, technologies and product considerations around Uninterruptible Power Supply (UPS).

Uninterruptible Power Supply (UPS) Basic: Power-Delivery Methods, Capacity Ranges, and How to Select the Right System. UPS ...

This article introduces the working principles of uninterruptible power supply, main types including standby (offline) UPS, line-interactive ...

Uninterruptible Power Supply (UPS) Basic: Power-Delivery Methods, Capacity Ranges, and How to Select the Right System. UPS systems are widely used in offices, server ...

Web: <https://aides-panneaux-solaire.fr>

