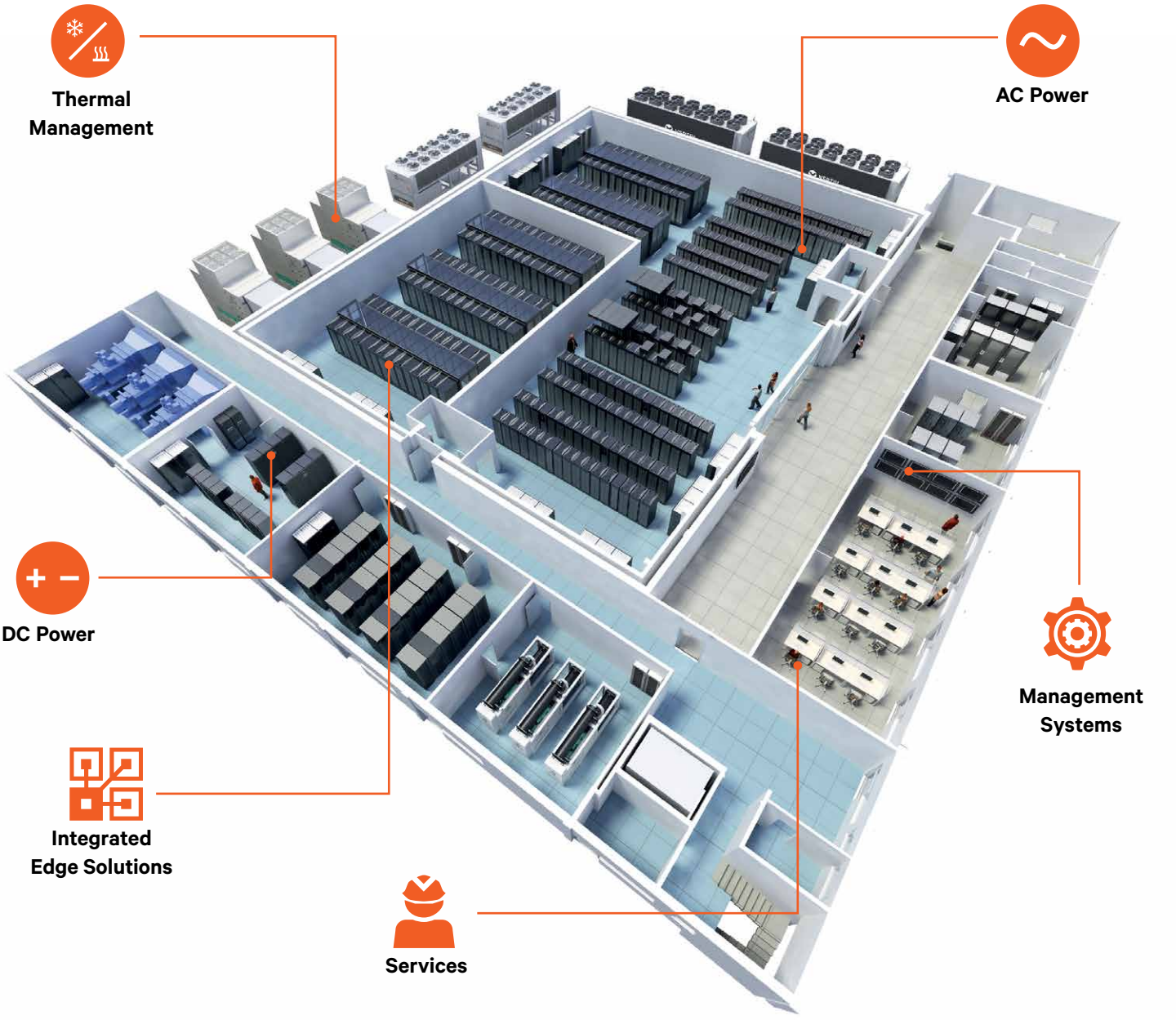
VERTIV.

# Liebert® Network Power Switch

Power Protection for
Business Critical Continuity

*Vertiv solves the most important challenges facing today's data centers, communication networks and commercial & industrial facilities with a portfolio of power, cooling and IT infrastructure solutions, and services that extends from the cloud to the edge of the network.*

## Architects of Continuity™




## What are our core differentiators?

*VISIONARY EXPERTISE*

*IMMERSIVE COLLABORATION*

*RELENTLESS AGILITY*

*INTELLIGENT ECOSYSTEM*

## Intelligent static transfer switches
## Network Power Switch - I, Network Power Switch - II

Ensures maximum reliability to critical loads by eliminating system failures that are caused by power distribution problems.

### Network Power Switch - I
NPS-I R31 16A, 32A, 63A, 100A, 150A, 200A, 250A, 300A Single Phase -1 Pole

### Network Power Switch - I N
NPS-I R32 16A, 32A, 63A, 100A, 150A, 200A, 250A, 300A Single Phase -2 Pole

### Network Power Switch - II
NPS-II FL3 60 to 400A Three Phase - 3 Pole

### Network Power Switch - II N
NPS-II FL4 100 to 300A Three Phase - 4 Pole

## FEATURES

**Uses Power Semiconductors as Switching Element**
It acts like protective barrier to the load. When power supply feeding to the load goes beyond the preset limits (Frequency or voltage) the switch instantly disconnects from load and protects it.

**Microcontroller Feature**
Microcontroller enabes source functioning and its control scheme. The smart control enables user to select the priority of source.

**Simple & Rugged design**
Low component count, giving high level of reliability.

**User friendly display[A] & Control**
Display provides status of incoming power source and the condition of static switch.

**Exceptional Performance**
It is tailored to suit the requirements of different operating conditions. It tracks the Input Voltage, Phase & Frequency, Distortion levels at the terminal points. If these parameters are within the limits then depending upon the priority selection, it activates the respective switch. This ensures the power availability to the load

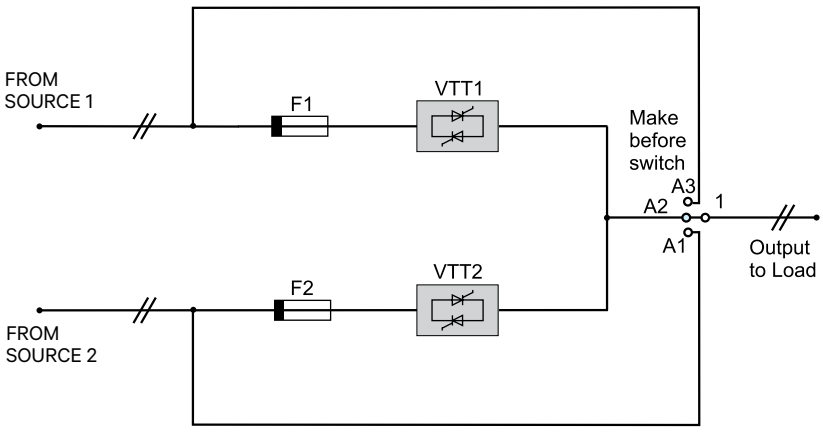
**MODBUS RS 232/485 Interface (optional)**
To connvvect your building Management System (BMS) for monitoring of all status & alarms

**Potential Free contacts[B] (optional)**
For remote monitoring of the switch activity

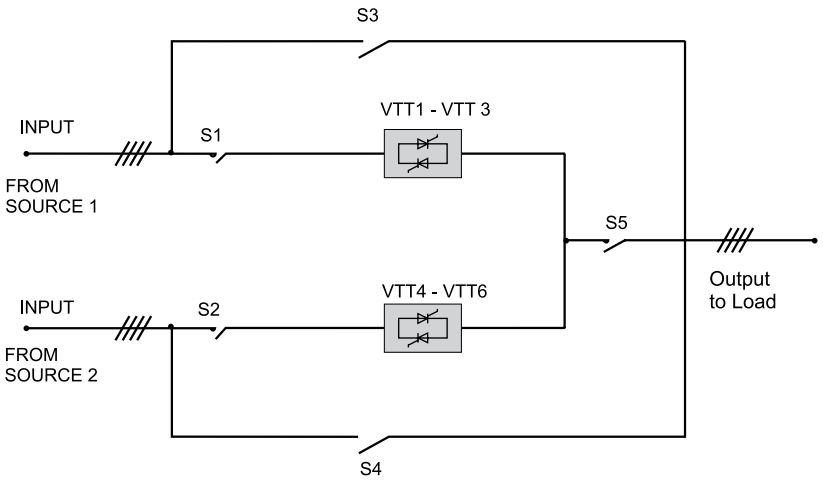
The NPS-I & NPS-II switches allows instantaneous transfer of load between two power sources. It can be used to ensure complete redundancy of power supply upto the last piece of wire. It is useful in many applications, where redundant power supply is available, either from two UPS systems or one UPS and bypass source.

These switches are comprising of semiconductor switches, they ensure continuity of power to the load in the event of failure of one of the power sources. They have different user selectable parameters and in-built microprocessor.

## SINGLE LINE DIAGRAM

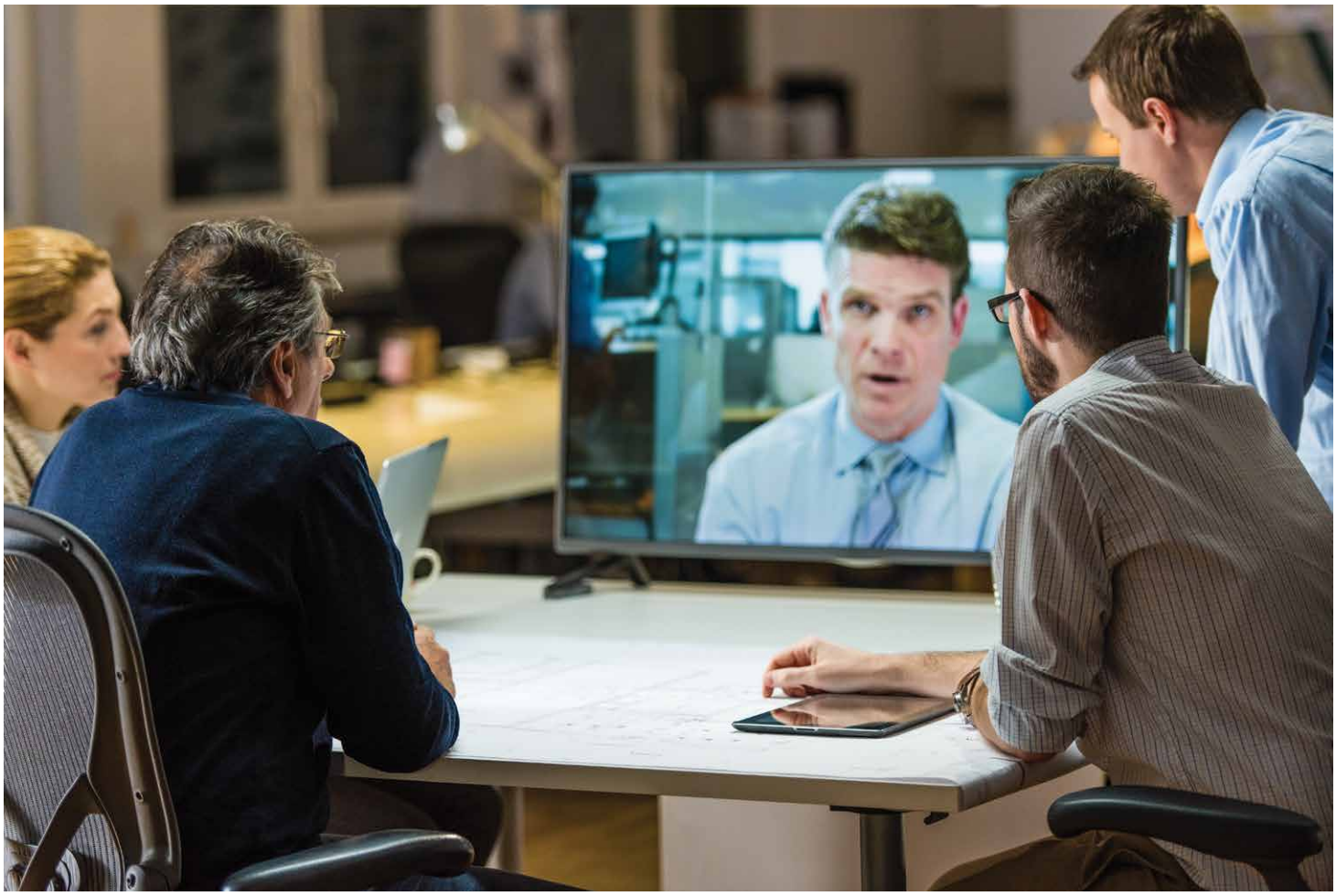



NPS-I




NPS-II

*NOTE : A : Display is available for NPS-II ; NPS MON is available for NPS-I*
*B : Potential free contact optional feature is available in NPS-I*
*For NPS-II if potential free contacts are required, contact Product / Marketting*



## FUNCTION

In a typical connection (see diagram) two different power sources (UPS, Stabiliser, Power conditioner etc.) are connected to the critical load through NPS-I / NPS-II switch, which will intelligently monitor the power from the sources. Depending upon the preset limits, it will allow the power to be passed to the critical load & thus making it as the best solution for mission critical applications.

## APPLICATIONS

- Data Centers
- Call Centers
- Process Control
- Automation

FRONT VIEW (3U SIZE)


REAR VIEW (3U SIZE)


***NOTE** : 4U size is also available*

## Technical Specifications

| Model | NPS-I R31 | | | NPS-I R32 | | |
|---|---|---|---|---|---|---|
| No. of Switching Poles | 1 Pole (Ph) | | | 2 Pole (Ph + N) | | |
| Nominal Output Current[1] | 16 A | 32 A | 63 A | 16 A | 32 A | 63 A |
| Nominal Voltage[1][4] | 220 / 230 / 240 V, 1 Phase (110 / 120 V optional) | | | | | |
| Voltage Tolerance[2] | - 15% to + 10% (Default) | | | | | |
| Nominal Frequency | 50 / 60 Hz, ± 2 Hz (Default) | | | | | |
| Efficiency[5] | At full load & nominal input voltage | | | | | |
| Efficiency AC to AC[7] | Static Switch Rating | | Efficiency (%) for 1P | | Efficiency (%) for 2P | |
| | 16A / 110Vac | | 97 | | 96 | |
| | 16A / 230Vac | | 98.5 | | 98 | |
| | 32A / 110Vac | | 98 | | 96.5 | |
| | 32A / 230Vac | | 99 | | 98 | |
| | 63A / 110Vac | | 98 | | 97 | |
| | 63A / 230Vac | | 99 | | 98 | |
| Overload Capacity [8] | 106% to 125% for < 1 Hrs., 125 to 150% for < 10 min., 150 to 200% for < 1 min., 200 to 400% for < 700 ms., 400 to 700% for < 100 ms, >700% for < 60 ms | | | | | |
| Duty | Continuous | | | | | |
| Protections [8] | Input Under Voltage, Input Over Voltage, Output Overload, Output Short Circuit | | | | | |
| Transfer / Re-transfer Time [2][7] | < 5 ms for Sync. condition | | | | | |
| | < 5 ms / < 15 ms (selectable) for No Sync. Condition | | | | | |
| Manual Bypass facility | Make before break | | | | | |
| Acoustic Noise Level[6] | <45 dBA | | | | | |
| Operating Temperature | 0 to 40° C | | | | | |
| Relative Humidity | Up to 95% (Non-condensing) | | | | | |
| Altitude | < 1000 meter, above sea level (without de-rating) | | | | | |
| Reference standard | IEC 62310 | | | | | |
| Enclosure Protection | IP 20 | | | | | |
| Cooling | Natural Cooling | | | | | |
| Dimension (in mm) WxDxH | 440 x 450 x 132 (480 Including Side Clamp x 450 x 132), 19" Rack mountable, 3U Height | | | | | |
| Color | RAL 7021 | | | | | |
| Weight (Approx) | 20 kg | | | | | |
| Cable Entry | Rear Side | | | | | |
| LED Indications | Source 1 Healthy | | Source 1 Feeding load | | Source 1 Priority | |
| | Source 2 Healthy | | Source 2 Feeding load | | Source 2 Priority | |
| | Source 1 Fuse Fail | | No Sync | | | |
| | Source 2 Fuse Fail | | Alarm | | | |
| | Load on Manual Bypass - Source 1 | | Load on Manual Bypass - Source 2 | | Load on Static Switch | |
| PFC [1] | Source 1 Abnormal or Back Feed (Optional) | | Source 2 Abnormal or Back Feed (Optional) | | Alarm | |
| Other Features | • DSP Based control | | • Hot Swappable Electronics static switching module | | | |
| | • Back feed protection (Optional) | | • Fixed or variable source priority mode and selection of preferred source [3] | | | |
| | • Inbuilt Static Switch fault detector | | • Short circuit protection by electronic circuit | | | |
| | • INSTAMON Software for monitoring all status & alarm (Optional) | | | | | |
| Communication Interface | RS 232 or Ethernet Connectivity, RS 485 MODBUS (Optional) | | | | | |
| Output Sockets | 6 Outlets as per IEC320-C13 (Default) (Rating 10 A / 250 VAC) | | or | 2 Outlet as per IEC320-C19 (Optional) (Rating 16 A / 250 VAC) | | |

*(1) Factory setting (2) Settable from "Insta Mon Software" (3) Settable from "Insta Mon Software" as well as from "Operator control panel"*
*(4) Allowable source voltage distortion (THD) < 10% (5) For tolerance see IEC 60146-1-1*
*(6) Acoustic Noise Level from 1 meter (Ref. ISO 3746)V (7) Efficiency & Transfer time is specified for Linear load*
*(8) Settable from "Insta Mon Software" & Overload Capacity calculated using I2T method, Also No tripping action on overload.*

## Technical Specifications

| Model | NPS-II FL3 | | | | NPS-II FL4 | | |
|---|---|---|---|---|---|---|---|
| Ampere Rating | 60 / 100 A | 200 A | 300 A | 400 A | 100 A | 200 A | 300 A |
| Input / Output | 3 Phase | | | | 3 Phase | | |
| No. of Switching Poles | 3 Pole (Ph) | | | | 4 Pole (Ph+N) | | |
| Nominal Output Current | 60 / 100 A | 200 A | 300 A | 400 A | 100 A | 200 A | 300 A |
| Nominal Voltage | 400 / 415 V (3 Ph + N) | | | | | | |
| Voltage Tolerance | Low band: -30% to +15% (Default), Medium band : -25% to +15%, Narrow Band : -15% to +15% | | | | | | |
| Nominal Frequency | Nominal: 48 - 52 Hz, Wide 40 - 70 Hz (Default) | | | | | | |
| Efficiency [1] | > 98% | | | | > 97% | | |
| Overload Capacity [3] | 110% for 1 hour, 150 % for 1 min., 200 % for 10 sec., 1000 % for 100 ms | | | | | | |
| Duty | Continuous | | | | | | |
| Protections [3] [4] | Input Under Voltage, Input Over Voltage, Output Overload, Output Short Circuit | | | | | | |
| Transfer / Retransfer Time | Low Sensitivity : < 8 ms, Medium Sensitivity : < 5 ms (Default), High Sensitivity: < 3 ms | | | | | | |
| Manual Bypass facility | Provided | | | | | | |
| Acoustic Noise Level [2] | < 60 dBA | | | | | | |
| Operating Temperature | 0 to 40° C | | | | | | |
| Relative Humidity | up to 95% (Non-condensing) | | | | | | |
| Altitude | < 1000 meter, above sea level (without de-rating) | | | | | | |
| Testing Standard | IEC 62310 -3 | | | | | | |
| Enclosure Protection | IP 20 | | | | | | |
| Cooling | Forced Cooling | | | | | | |
| Dimension (in mm) - Width | 800 | 800 | 1000 | 1000 | 800 | 1000 | 1000 |
| - Depth | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| - Height | 1750 | 1750 | 1950 | 1950 | 1750 | 1950 | 1950 |
| Weight in kg (approx) | 225 | 225 | 275 | 350 | 225 | 250 | 275 |
| Color | RAL 7021 | | | | | | |
| LCD Display parameters | Source 1 R phase voltage<br>Source 1 Y phase voltage<br>Source 1 B phase voltage | | Source 2 R phase voltage<br>Source 2 Y phase voltage<br>Source 2 B phase voltage | | Output Load R<br>Output Load Y<br>Output Load B | | Date & Time |
| LED Indications | Source 1 Healthy<br>Source 2 Healthy | | Source 1 Feeding<br>Source 2 Feeding | | Source 1 Priority<br>Source 2 Priority | | Sensitivity Low<br>Sensitivity Medium<br>Sensitivity High |
| Fault Indications | Overload | | | | | | |
| Communication Interface | RS 485 Modbus (optional) | | | | | | |

*(1) For tolerance see IEC 60146-1-1*
*(2) Acoustic Noise measured @ 1.0 meter as per ISO 3746*
*(3) No tripping action on overload, message is displayed.*
*(4) Output Short Circuit is for protection of SCRs; Customer need to provide upstream fuses or ask for semiconductor fuse box (This wall mounted box is an optional).*

*Specifications subject to change without prior notice.*

## Technical Specifications

| Type | NPS-I FL I | | | | | NPS-I FL II | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Input / Output | | | | | | | | | | |
| Nominal Voltage[1] [4] | 220 / 230 / 240 V, 1 Phase (110 / 120 V optional) | | | | | | | | | |
| Voltage Tolerance[2] | -15 % to +10 % (Default) | | | | | | | | | |
| Frequency[5] | 50 / 60 Hz | | | | | | | | | |
| Frequency Tolerances | ± 3 Hz (Default) | | | | | | | | | |
| Nominal Output Current[1] | 100A | 150 A | 200 A | 250 A | 300A | 100A | 150A | 200 A | 250 A | 300 A |
| Input Sources | 2 Nos. | | | | | | | | | |
| No. Of Switching Poles | 1 Pole (Ph) | | | | | 2 Pole (Ph+N) | | | | |
| Overload Capacity [8] | 106% To 125% For <1 Hrs., 125 To 150% For <10 Min., 150 To 200% For <1 Min., 200 To 400 For <700 ms., 400 To 700% For< 100 ms, >700% For <60 ms | | | | | | | | | |
| Duty | Continuous | | | | | | | | | |
| Load Power Factor Range | 0.6 to unity leading or lagging | | | | | | | | | |
| Static Switch | | | | | | | | | | |
| Transfer/Retransfer Time For Sync Condition[2] [7] | < 5 ms | | | | | | | | | |
| Transfer/Retransfer Time For No-Sync Condition[2] [7] | < 5 ms / < 15 ms | | | | | | | | | |
| Manual Bypass Switch | Provided | | | | | | | | | |
| Efficiency (Ref. Iec 60146-1-1) | At full load & nominal input voltage | | | | | | | | | |
| Efficiency-Ac To Ac [7] | Static Switch Rating | Efficiency (%) For 1pole | | | | Efficiency (%) For 2pole | | | | |
| | 100A / 110V ac | 98 | | | | 97 | | | | |
| | 100A / 230V ac | 99 | | | | 98 | | | | |
| | 150A / 110V ac | 98 | | | | 97 | | | | |
| | 150A / 230V ac | 99 | | | | 98 | | | | |
| | 200A / 110V ac | 98 | | | | 97 | | | | |
| | 200A / 230V ac | 99 | | | | 98 | | | | |
| | 250A / 110V ac | 98 | | | | 97 | | | | |
| | 250A / 230V ac | 99 | | | | 98 | | | | |
| | 300A / 110V ac | 98 | | | | 97 | | | | |
| | 300A / 230V ac | 99 | | | | 98 | | | | |

*(1) Factory setting*
*(2) Settable from "Insta Mon Software"*
*(3) Settable from "Insta Mon Software" as well as from "Operator control panel"*
*(4) Allowable source voltage distortion (THD) < 10%*
*(5) For tolerance see IEC 60146-1-1*
*(6) Acoustic Noise Level from 1 meter (Ref. ISO 3746)V*
*(7) Efficiency & Transfer time is specified for Linear load*
*(8) Settable from "Insta Mon Software" & Overload Capacity calculated using I2T method, Also No tripping action on overload.*

## Technical Specifications

| ENVIRONMENTAL | | | | |
|---|---|---|---|---|
| Acoustic Noise Level from 1 Meter (Ref. ISO 3746) | | ≤ 60 dB (For 100A & 150A), ≤ 65 dB (For 200A, 250A & 300A) | | |
| Operating Temperature | | 0 to 40 Deg C | | |
| Storage Temperature | | 0 to 70 Deg C | | |
| Relative Humidity | | Up to 95% RH, (Non-condensing) | | |
| Altitude | | < 1000 meter above sea level (without de-rating) | | |
| **Physical** | | | | |
| Enclosure Protection | | IP 42 - Standard | | |
| Grade | | | | |
| Cooling | | Forced Air | | |
| Color | | RAL 7021 (Default) | | |
| Cable Entry | | Bottom | | |
| Dimensions (In Mm) | For | FL I & FL II | | |
| | Width | 800 | | |
| | Depth | 600 | | |
| | Height | 1600 + 150 + 100 (Panel Height + Plinth + Canopy) | | |
| | Weight | 230 kg Appx. | | |
| Installation | | Free standing floor mounted | | |
| **Led Mimic** | | | | |
| Indications On Mimic | ➲ Source 1 Healthy | ➲ Source 1 Feeding load | ➲ Source 1 Fuse Fail | |
| | ➲ Source 2 Healthy | ➲ Source 2 Feeding load | ➲ Source 2 Fuse Fail | |
| | ➲ Source 1 Priority | ➲ No Sync | | |
| | ➲ Source 2 Priority | ➲ Alarm | | |
| For Switch Position | ➲ Load on STSW | ➲ Load on Source 1<br>Manual Bypass | ➲ Load on Source 2<br>Manual Bypass | |
| **Pfc** (1) | | | | |
| Available Signals | ➲ Source 1 Abnormal or<br>Source 1 Back Feed (Optional) | ➲ Source 2 Abnormal or<br>Source 2 Back Feed (Optional) | ➲ Alarm | |
| Contact Rating | ➲ 2 Amp for 30 VDC<br>1 Amp for 125 VAC | | | |
| Communication Interface | RS 232 or Ethernet Connectivity, RS 485 MODBUS (Optional) | | | |

*(1) Factory setting*
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*(3) Settable from "Insta Mon Software" as well as from "Operator control panel"*
*(4) Allowable source voltage distortion (THD) < 10%*
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