

NFC40 SERIES

Single and triple output



[2 YEAR WARRANTY]

- 40 Watts in a 2.2 x 2.2 x 0.5 inch case
- Base plate cooled patented topology
- Remote ON/OFF control
- Short circuit protection
- Industry standard pin-out
- UL, CSA and VDE safety approvals
- Extended operating temperature range option
- Fixed frequency operation


Providing 40W of power in a 2.2 x 2.2 x 0.5 inch package, the highly specified NFC40 Series of DC/DC converters were designed with today's demanding applications in mind. Inherent design specifications of the NFC40 include tight line and load regulation and high power density. Standard features provided by all members of the NFC40 Series are remote on/off, synchronization function, short circuit protection, overvoltage protection and an output voltage trim function. To maximize the board area available to system designers, the NFC40 footprint has been minimised without compromising on features or profile. A comprehensive package of heatsink and operating temperature options are included to further increase the flexibility offered. Artesyn Technologies has utilised its latest patented topology implemented in SMT and hybrid technologies to achieve this performance level. Typical applications for the NFC40 Series include telecommunications, remote exchanges, automation equipment, back plane power architectures and distributed power.

SPECIFICATION All specifications are typical at nominal input, full load at 25°C unless otherwise stated


| OUTPUT SPECIFICATIONS | | |
|--|---|--|
| Voltage adjustability | All outputs, See Note 8 | ±10% |
| Total error band See Note 1 | Single outputs ±2% typ., ±3% max. Auxiliary outputs ±3% typ., ±5% max. | |
| Ripple and noise | 5Hz to 20MHz All outputs | 100mV pk-pk, max. 20mV rms |
| Transient response | 0.25% FL to 0.5% FL | ±2% max. dev., 100µs recovery |
| Temperature coefficient | Single outputs Auxiliary outputs | ±0.02%/°C max. ±0.03%/°C max. |
| Overvoltage protection | Single output Triple output | Clamp type See table |
| Short circuit protection | | Continuous automatic recovery |
| Minimum main output current | Singles Triples, to maintain auxiliary output regulation | 0A 0.5A |
| INPUT SPECIFICATIONS | | |
| Input voltage range | 24V 48V | 18 to 36VDC 36 to 72VDC |
| Input filter | See Note 9 | External capacitor |
| Remote ON/OFF Logic compatibility ON OFF | | CMOS and TTL >1.5V or open collector <0.4V |
| Synchronization function Frequency control range Sync signal | Operating frequency control ±10% | Negative-going pulse, maximum 25% of duty cycle |
| Logic compatibility | | CMOS/TTL |

| GENERAL SPECIFICATIONS | | |
|--------------------------------|---|--|
| Efficiency | See table | 80%, min. |
| Isolation voltage | Input/output | 500VAC, 710VDC, min. |
| Switching frequency | Fixed | 300kHz ±5.0% |
| Approvals and standards | | VDE0805, EN60950 IEC950, UL1950 CSA C22.2 No. 950 |
| Case material | | Black coated metal with Non-conductive base |
| Material flammability | | UL94V-0 |
| Weight | | 80g (2.8oz) |
| ENVIRONMENTAL SPECIFICATIONS | | |
| Thermal performance Note 11 | Operating ambient Operating Case Non-operating Extended temp., option, case, Note 10 Heatsink option, Note 5 Derating | See curves -25°C to +105°C -55°C to +125°C -40°C to +105°C See curves See curves for baseplate cooling details |
| Relative humidity | Non-condensing | 5% to 95% RH |
| Altitude | Operating Non operating | 10,000 feet max. 40,000 feet max. |

International Safety Standard Approvals

 VDE0805/EN60950/IEC950 File No. 10401-3336-1082

 UL1950 File No. E136005

 CSA C22.2 No. 950 File No. LR41062C

40 Watt Wide input DC/DC converters

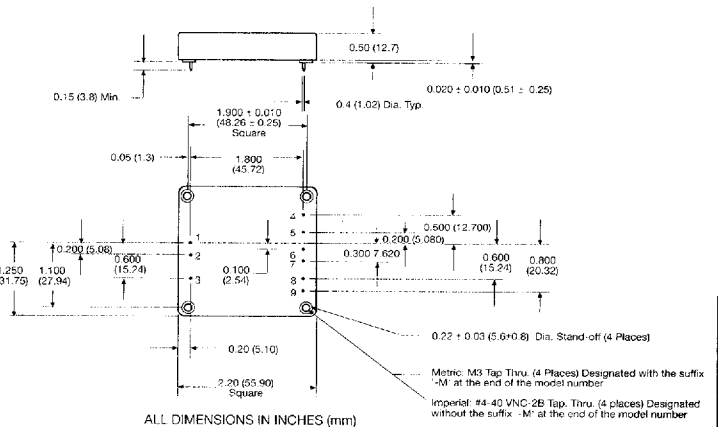
| INPUT VOLTAGE (2) | OUTPUT VOLTAGE | OVP (3) | MAX. OUTPUT CURRENT | INPUT CURRENT (4) | TYPICAL EFFICIENCY | MODEL NUMBER (6, 10) | |
|-------------------|----------------|-------------|---------------------|-------------------|--------------------|----------------------|--------------------|
| | | | | | | METRIC INSERTS | IMPERIAL INSERTS |
| 18-36VDC | 5VDC | 6.2VDC | 8A | 2.15A | 80% | NFC40-24S05-M | NFC40-24S05 |
| 18-36VDC | 12VDC | 15VDC | 3.5A | 2.1A | 82% | NFC40-24S12-M | NFC40-24S12 |
| 18-36VDC | 15VDC | 18VDC | 2.8A | 2.1A | 82% | NFC40-24S15-M | NFC40-24S15 |
| 18-36VDC | 5/±12VDC | 6.2VDC/None | 7.5/±0.75A | 2.15A | 80% | NFC40-24T05-12-M | NFC40-24T05-12 (6) |
| 18-36VDC | 5/±15VDC | 6.2VDC/None | 7.5/±0.75A | 2.15A | 80% | NFC40-24T05-15-M | NFC40-24T05-15 (6) |
| 36-72VDC | 5VDC | 6.2VDC | 8A | 1.1A | 81% | NFC40-48S05-M | NFC40-48S05 |
| 36-72VDC | 12VDC | 15VDC | 3.5A | 1.05A | 83% | NFC40-48S12-M | NFC40-48S12 |
| 36-72VDC | 15VDC | 18VDC | 2.8A | 1.05A | 83% | NFC40-48S15-M | NFC40-48S15 |
| 36-72VDC | 5/±12VDC | 6.2VDC/None | 7.5/±0.75A | 1.1A | 81% | NFC40-48T05-12-M | NFC40-48T05-12 (6) |
| 36-72VDC | 5/±15VDC | 6.2VDC/None | 7.5/±0.75A | 1.1A | 81% | NFC40-48T05-15-M | NFC40-48T05-15 (6) |

Notes

- Total error band is defined at the static output regulation at 25°C, including initial setting accuracy, line voltage within stated limits and load current within stated limits.
- Nominal input voltages are 24VDC and 48VDC.
- Overvoltage protection threshold. Any main output overvoltage clamps the output to a very low output voltage. A prolonged overvoltage condition will cause the converter to fail.
- Maximum value at full load, nominal input voltage.
- For top-mounted heatsink option with Metric screws, add '-MX' or '-MY' to these model numbers. For side-mounted heatsink option, add '-ME' or '-MS' to the model number e.g. **NFC40-48S05-MX**. For top-mounted heatsink option with Imperial screws, add '-1X' or '-1Y' to these model numbers. For side-mounted heatsink option, add '-1E' or '-1S' to the model number e.g. **NFC40-48S05-1X**.
- For triple output units, common pins (5 and 8) should be connected externally.
- Output V1 must return to common 1 and outputs V2 and V3 to common 2 and 3 respectively in order to meet noise and regulation specifications.
- The external trim function enables the tailoring of the output voltage to the applications exact requirements. Adjustments within ±10% are possible. On the triple output models the auxiliary output voltages (output 2 and 3) will vary proportionally to the main output.
- An external filter capacitor is required for normal operation. The capacitor should be capable of handling 1A/2A ripple current for 48V/24V models. Artesyn suggests: Nippon Chemi-Con SXE series, 220µF/100V for the NFC40-48xxx-M and the Nippon Chemi-Con LXF Series, 1500µF/50V for the NFC40-24xxx-M.
- Extended operating temperature range. To specify an NFC40 that operates down to -40°C, add the suffix '4' or '-4' to the model number e.g. **NFC40-48S05-M4** or **NFC40-48S05-4** for Metric and Imperial screw measurements respectively.
- Case temperature must not exceed +105°C. Curve may be extended or restricted depending on available cooling.

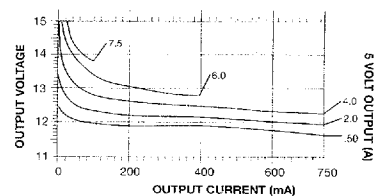
Mechanical notes

- All pins are actual to within 0.010 inch (0.25mm) diameter.
- Tolerances:
 - Imperial 0.XX ± 0.02 inch
 - 0.XXX ± 0.005 inch
 - Metric 0.X ± 0.5mm
 - 0.XX ± 0.13mm
 Unless otherwise specified.
- Metric dimensions in brackets, e.g. 1.250" (31.75mm).
- Copper tracks must not be routed under the four converter stand-offs.

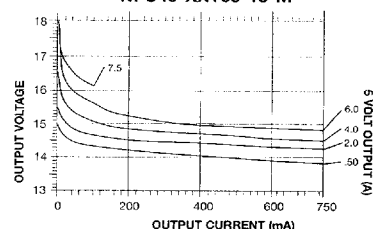


| PIN CONNECTIONS (6,7) | | |
|-----------------------|---------------|---------------|
| PIN NUMBER | SINGLE OUTPUT | TRIPLE OUTPUT |
| 1 | + Input | + Input |
| 2 | - Input | - Input |
| 3 | Control | Control |
| 4 | No Connection | + Vout 2 |
| 5 | No Connection | Common 2, 3 |
| 6 | No Connection | - Vout 3 |
| 7 | + Output | + Vout 1 |
| 8 | Common | Common 1 |
| 9 | Trim | Trim |

Auxiliary Load Regulation
NFC40-XXT05-12-M



Auxiliary Load Regulation
NFC40-XXT05-15-M



40 Watt Wide input DC/DC converters

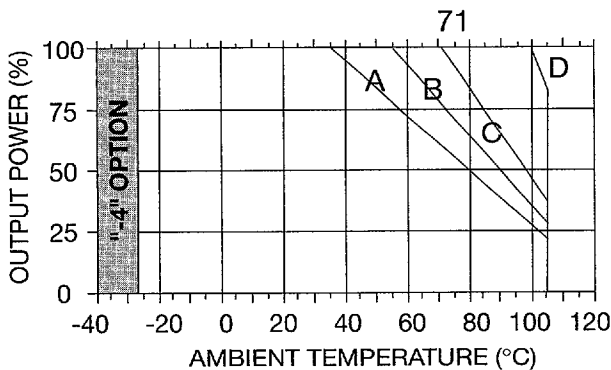
Derating Curves

The derating curves shown are based on measurements of actual power supplies and reflect Artesyn Technologies conservative design guidelines. Adherence to these guidelines contributes to the high reliability of our products by restricting the maximum operating semiconductor junction temperatures to 125°C which is well below the component manufacturers' maximum limits.

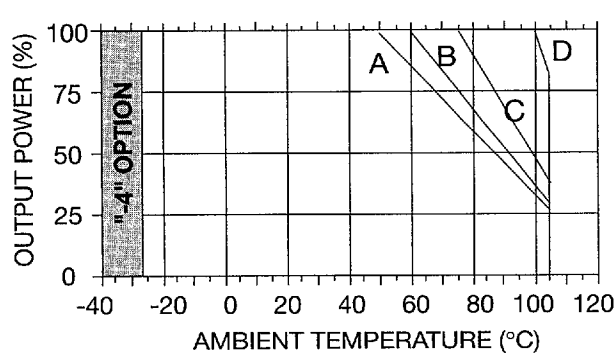
Key to power derating curves:

- A Natural convection.
- B 150 linear feet per minute forced air flow.
- C 300 linear feet per minute forced air flow.
- D Maximum case temperature

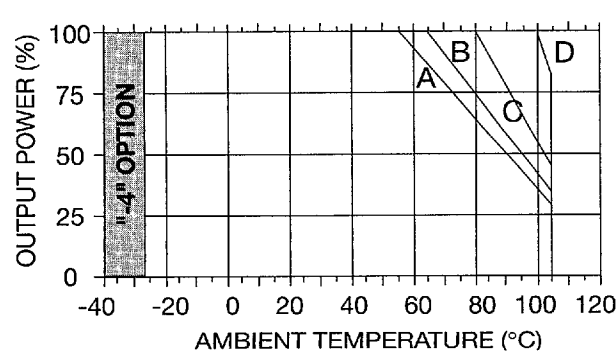
Power derating curve without additional heatsink



Power derating curve with side mounted heatsink

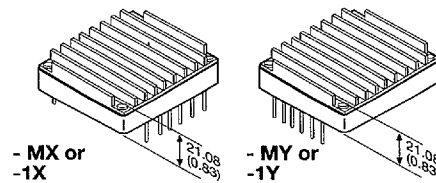


Power derating curve with top mounted heatsink

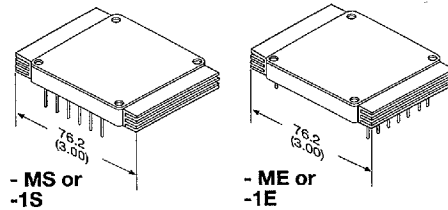


Heatsink mounting options

Top mounted



Side mounted



Heatsink options:

Two heatsink kits are available for the NFC40: top mounted and side mounted. Each heatsink may be oriented parallel to or perpendicular to the direction of the pins, thus providing optimum flexibility for cooling requirements.

Top mounted heatsink

If board area is at a premium in your application then the top mounted heatsink should be used. This heatsink kit comes complete with screws and is mounted as shown in the diagram over. To fit the heatsink, place it in the required orientation, and tighten the four screws. The order number for the top mounted heatsink kit with Metric screws is: **NFC40-HTSK-T**. The order number for the top mounted heatsink kit with Imperial screws is: **NFC40-HTSK-T-I**.

Side mounted heatsink

With many applications, e.g. rack systems, the profile must be kept to a minimum. The side mounted heatsink is intended to meet the requirements of low profile applications. The NFC40 with this heatsink option is 12.7mm (0.5 inch) high. The kit contains two side mounted heatsinks, which must be fitted opposite to one another on the NFC40. The order number for the side mounted heatsink is: **NFC40-HTSK-S**

Factory fitted heatsinks

As a further option, Artesyn Technologies offers factory fitted heatsinks. Simply add the suffix as described by the diagrams above to the part number: e.g. **NFC40-48S12-MY** or **NFC40-48S12-1Y** for Metric and Imperial screws respectively.

EXTERNAL OUTPUT TRIMMING (8)

