NTN21K0 Series

XP Power

AC-DC POWER SUPPLIES

21kW FULL RACK

The NTN21K0 series are highly stable linear regulated power supplies with low ripple and an isolated output. Featuring thyristor (SCR) pre-regulation followed by transistor regulation to provide double stabilization.

The power supplies can be operated in local, analog (optional) and digital (optional) operating modes.

Sense line connections provide feedback compensation for voltage drop in the load lines. The stated value of the maximum output voltage always refers to the output terminals.

Dimensions

See mechanical details table

Features

- Output voltages 0-6.5VDC to 0-350VDC isolated
- 3 phase AC input
- Continuous operation at full rated power
- Multi-function control panel with user friendly interface
- Digital, LAN and USB interface option
- Analog programming/interface option
- Manual voltage & current control with automatic transition & digital display
- Set-point display via a button
- Set-point adjustment possible with disabled output
- Push-button switch for output voltage
- Short circuit & arc protection
- Inrush current limitation
- 2 year warranty

Benefits

- Provides maximum device control & flexibility.
- Safe operation ensures maximum protection to the power supply
- User friendly controls
- Lighter than the leading brand products & easier to maintain
- Low cost of ownership

Applications

- Laboratory power

NTN21K0 Series

Models & Ratings

Model Number	Polarity	Output Voltage	Output Current	Input Voltage	Frequency
NTN21K0-6V5	Isolated	0 to 6.5V	0 to 2kA	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-12V5	Isolated	0 to 12.5V	0 to 1.5kA	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-20	Isolated	0 to 20V	0 to 800A	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-35	Isolated	0 to 35V	0 to 600A	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-65	Isolated	0 to 65V	0 to 300A	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-125	Isolated	0 to 125V	0 to 150A	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-200	Isolated	0 to 200V	0 to 100A	400VAC ±10% 3 phase	47 to 63Hz
NTN21K0-350	Isolated	0 to 350V	0 to 60A	400VAC ±10% 3 phase	47 to 63Hz

Options

- Coarse/fine-potentiometers (99%/1%) for more accurate adjustment of voltage and/or current
- Analog Programming/Interface
- Analog Programming/Interface, floating
- Computer interfaces -IEEE 488, RS 232, RS 422, RS485, Profi-bus DP, USB, LAN (more on request)
- Signal for output voltage <50V
- Higher stability
- Supply voltages other than that shown in the models & ratings table may be specified
- Stability over 8 hours under constant conditions: <±1 x 10-5
- Temperature coefficient: <±1 x 10-5 /K within the specified temperature range

Please consult XP Power Sales

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Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	See models and ratings table				
Efficiency	90	See notes & conditions	90%	%	6.5V to 20V typ. 70%-80% 35V to 350V typ. 90%
Overvoltage Category		II			
Protection Class		I			

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage Range	See models and ratings table				
Output Current Range	See models and ratings table				
Output Control	Continuous adjustment from 0 to rated voltage/current by front panel mounted potentiometers.				
Output Polarity	Isolated, each output terminal can be earthed. Exception: If a non-isolated Analog Programming/Interface is installed, the A+ output pole is earthed.				
Output Isolation	Each output pole can be put on a potential max. ±500V against PE. Exception: If a non-isolated Analog Programming/Interface is installed, the A+ output pole is earthed.				
HV Output Connection	Mating HV connector and 3m cable supplied				Outputs ≥650VDC are supplied with 2 sets
HV Insulating Medium	Outputs ≤10kV are air insulated, ≥30kV use solid dielectric silicone encapsulation				
Voltage Control Time	<5ms, typical 2ms with load changes from 10% to 100% or 100% to 10%				
Voltage Setting Range	Using the VOLTAGE potentiometer, approx. 0.1% to 100% of the rated value				
Current Control Time	<500ms with load changes <10%, depending on type. Devices with a rated voltage from 65V briefly shut down in the event of greater load changes, the residual energy is released in an unregulated manner.				
Current Setting Range	Using the CURRENT potentiometer, approx. 0.1% to 100% of the rated value				
Setting Time at Rated Load	<100ms to 500ms, depending on type, for changes in the output voltage from 10% to 90% or 90 to 10%, respectively				
Set Point Resolution	<±1 x 10^{-3} of rated value with potentiometer on front panel <±1 x 10^{-5} of rated value with fine potentiometer 1 x 10^{-4} of rated value with option interface				
Discharge Time Constant	Operated without a load the typical discharge time will be between 2s and 60s, depending on type				
Accuracy	Voltage <±0.2% of rated value Current <±0.2% of rated value for current ranging between >5mA to <200A Current <±0.5% of rated value for current ranges <5mA or >200A Additional digital display error <±2 digits				
Residual Ripple	<1 x 10^{-4} of rated value +30mVpp (measuring bandwidth 30Hz - 10MHz) <3 x 10^{-5} of rated value +10mV RMS				
Control Deviation	±10% mains voltage variation: <±1 x 10^{-5} of the rated value 0 to 100% load change: <±2 x 10^{-4} of the rated value Over 8 hours: <±1 x 10^{-4} of the rated value Temperature deviations <±1 x 10^{-4}/K of the rated value				
Short Circuit Protection	The power supply is short circuit and arc proof. The maximum current can be drawn at any output voltage, even in the event of a short circuit.				
Inrush Current Limiting	Standard for ≥700W				
Sense Line Connections	Compensate for voltage drop in the load lines (this applies for devices up to 350V output voltage) Voltage drop up to 5% (but at least 1V) of the nominal voltage will be compensated.				

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Temperature Operation	0		+40	˚C	
Storage Temperature	-20		+50	˚C	
Humidity Operating	0		+80	%	Up to +31°C, decreasing linearly down to 50% relative humidity at +40°C
Storage Humidity	No precipitation and max. relative humidity of 80%				
Cooling	Heat generated in the power supply unit is dissipated by convection or, in the case of high-power units, by forced ventilation				
Operating Altitude			2000	m	Above sea level
Protection	IP20				

Signals & Controls

	Function
Front panel	Voltage and current potentiometer, power switch, HV ON/OFF switch, digital display for current and voltage, voltage limit potentiometer. Display of the output voltage and current set points is possible with the SET VALUES push-button.
Operating Modes	The output's polarity is isolated (see models & ratings table). The power supplies can be operated in the LOCAL, ANALOG (optional) and DIGITAL (optional) operating modes.
Displays	DVM for voltage and current, range ±20000

EMC: Emissions

Phenomenon	Standard	Notes & Conditions
Harmonic Currents	EN61000-6-2	
Voltage Flicker	EN61000-6-3	

Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
EN	EN61010-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

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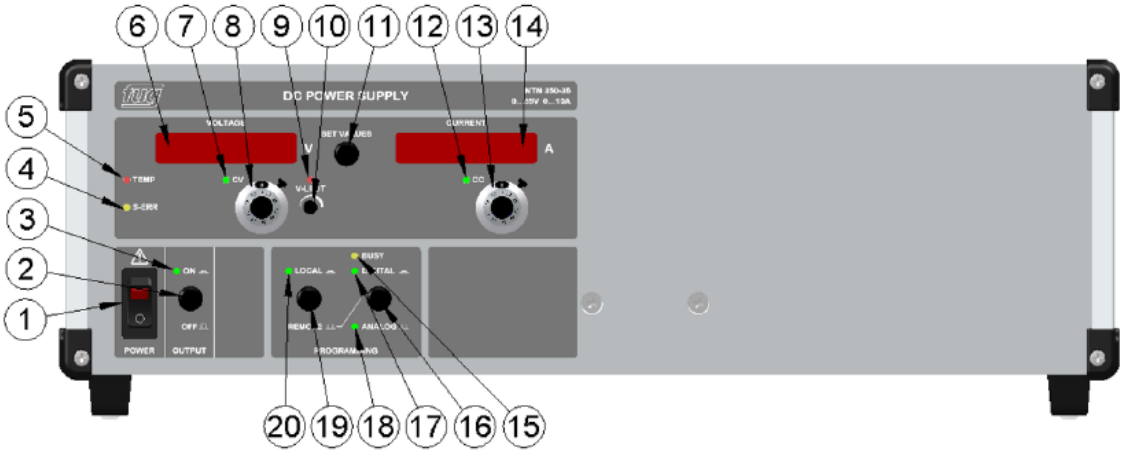
Mechanical Details

Front view with controls

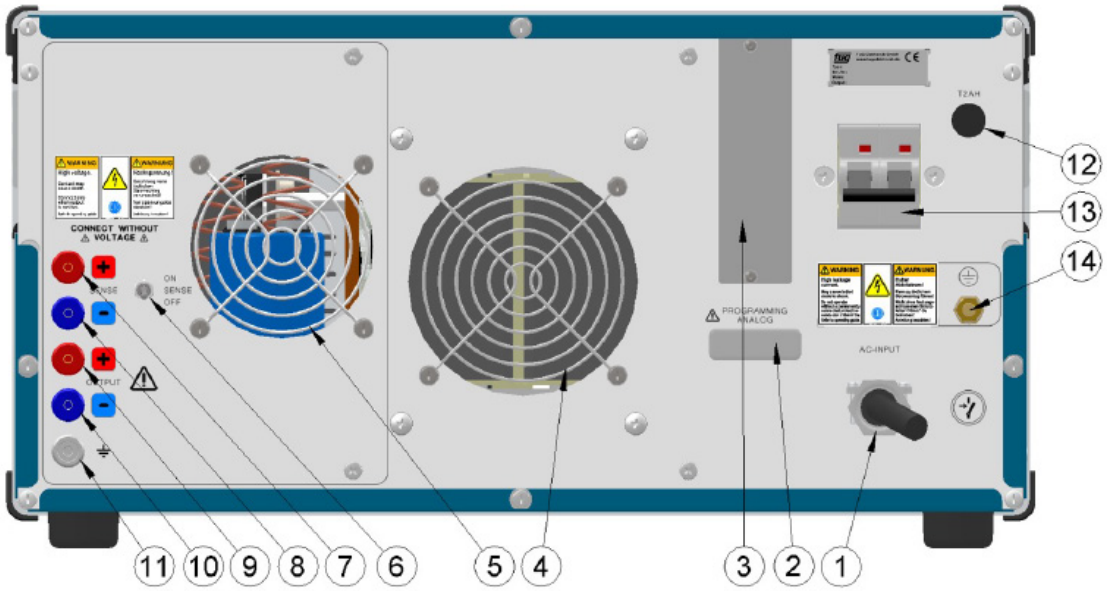


Front panel shown for illustrative purposes only, dimensions and layout differ by power rating - see mechanical details table.

Number	Function	Number	Function
1	AC power switch with indicator light Insulates the power supply from mains, two-pole disconnection	11	SET VALUES Switch displays between Set-point mode and Actual output mode, displays flashes when in set point mode.
2	Release of DC output (OUTPUT) No isolation from mains.	12	LED for constant current control mode (Constant Current CC)
3	LED: DC output ON Green when the controller and the power stage is operating (OUTPUT ON)	13	Ten-turn potentiometer with lockable precision dial for current adjustment
4	S-ERR LED for errors at the sense connections or sense lines	14	Current display flashing: Set point not flashing: Actual value
5	Over-temperature LED, internal device temperature too high, fan failure or restricted fan. (Use is type-dependent)	15	LED BUSY displays data traffic on the digital interface (Optional)
6	Voltage display flashing: Set point not flashing: Actual value	16	Switching the operation mode between REMOTE/ANALOG and REMOTE/ DIGITAL (Optional)
7	LED for constant voltage control mode (Constant Voltage CV)	17	LED indicating digital programming active (Optional)
8	Ten-turn potentiometer with lockable precision dial for voltage adjustment	18	LED indicating Analog Programming/Interface active (Optional)
9	LED for active voltage set-point limitation	19	Switching the operation mode between LOCAL and REMOTE (Optional)
10	Set-point limit adjustment for voltage V-LIMIT (can only be operated with a tool)	20	LED indicating local control mode active (Optional)

Mechanical Details

Rear view with 2 or 3 phase AC input



Rear panel shown for illustrative purposes only, dimensions and layout differ by power rating - see mechanical details table.

Number	Function	Number	Function
1	2 or 3 phase input (model dependant)	8	Negative connection for sensor line (SENSE -)
2	(Optional) 15-pin Sub-D connector for Analog programming/ interface	9	Positive output A+ (Up to 20A 4mm safety sockets, for current up to 300A screw terminals, beyond 300A copper bars)
3	(Optional) Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...)	10	Negative output A- (Up to 20A 4mm safety sockets, for current up to 300A screw terminals, beyond 300A copper bars)
4	Cooling air outlet	11	Earthing socket: This connection can be connected to the ground of the load; this applies for devices with an output current ≤20A
5	Cooling air outlet	12	Fuse holder for internal control fuse
6	Switch for sensor (SENSE ON / OFF)	13	Automatic circuit breaker
7	Positive connection for sensor line (SENSE +)	14	Earthing bolt: The DC power supply must be professionally earthed using 10mm² cable to the earthing bolt provided.

NTN21K0 Series

Mechanical Details

Model Number	Mounting	Width		Height		Depth	Weight
NTN21K0-6V5	Full rack	19”	600mm	42U	2200mm	800mm	650kg
NTN21K0-12V5	Full rack	19”	600mm	42U	2200mm	800mm	600kg
NTN21K0-20	Full rack	19”	600mm	42U	2200mm	800mm	580kg
NTN21K0-35	Full rack	19”	600mm	42U	2200mm	800mm	530kg
NTN21K0-65	Full rack	19”	600mm	42U	2200mm	800mm	510kg
NTN21K0-125	Full rack	19”	600mm	33U	1800mm	800mm	490kg
NTN21K0-200	Full rack	19”	600mm	33U	1800mm	800mm	490kg
NTN21K0-350	Full rack	19”	600mm	33U	1800mm	800mm	490kg

Cables

Mains input cable
2 or 3 phase mains: open end for plug to be assembled

Mating Connectors
For control inputs and outputs not included (Digital interface cables are commercially available)