

FTR7000 series

Regenerative high power programmable DC electronic load



Summary

FTR7000 series is a feedback-type programmable DC electronic load. It not only possesses the traditional consumption-type load functions, but also recovers the energy consumed by the traditional load back to the power grid, achieving the purpose of energy conservation. It can be widely applied in the testing of new energy equipment, the discharge testing of lithium-ion and fuel batteries, automatic testing systems, the testing of single-directional module products such as AC/DC and DC/DC, and aging. The product is equipped with rich communication and programming interfaces, as well as color screens and various text menu interfaces. The operation is convenient and intuitive, and it is commonly used equipment in industries such as power electronics, new energy, sensors, motor drives, and system integration.

Characteristic

- Single machine range:
 - Voltage: 0~2250V,
 - Current: 0~3240A ,
 - Power: 0~300kW;
- Master/slave parallel expansion power up to 3MW;
- Voltage accuracy: 0.05% + 0.05% of the full scale; Current accuracy: 0.1% + 0.2% of the full scale;
- Power factor: 0.99, and the overall efficiency is higher than 93%;
- Automatic line loss compensation;
- Capable of constant voltage, constant current, constant power, and constant resistance functions;
- Voltage and current slope can be set;
- Battery discharge test function;
- Sequence and waveform functions, which can realize complex voltage and current waveforms such as automotive electronic test voltage waveforms and user-defined waveforms;
- Comprehensive protection functions including overvoltage, overcurrent, overpower, overtemperature, undervoltage, power failure, islanding protection, etc;
- High-voltage isolation digital and analog, monitoring, control interfaces;
- Communication interfaces are standard with LAN and USB, and optional with RS485, CAN or GPIB;
- Communication protocols support SCPI, MODBUS, CAN-OPEN (optional) protocols, and provide upper computer and SDK development packages for secondary development;
- TFT color liquid crystal display, Chinese, English, and simplified Chinese menu interface;
- Intelligent fan control;
- Standard 19-inch rack-mounted design, with over 16U options for wheel design.

Application field

- Energy storage, microgrid equipment production and development;
- Production and development of server power supply, UPS and inverter;
- Solar arrays, wind power applications;
- Fuel cell, power battery, lead battery, ultracapacitor application;
- Aerospace, railway, new energy vehicles, motor drive test and application;
- UAV, laser, sensor applications.

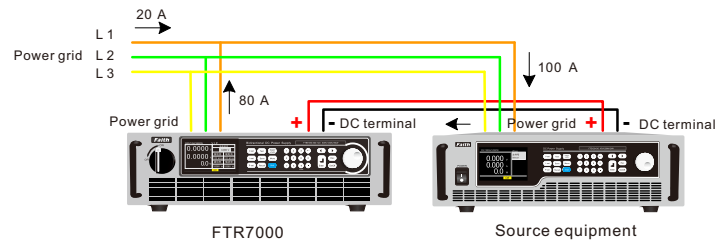
Sine wave dynamic load

FTR7000 series has sine-wave current-carrying capability and can be used for impedance analysis and testing of fuel cells.



Regenerative

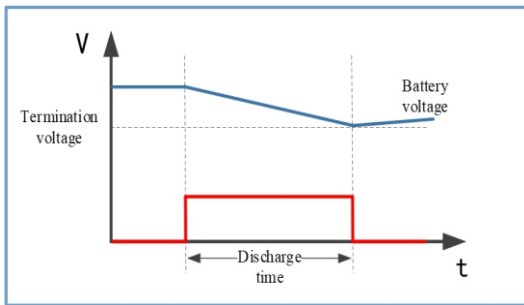
FTR7000 series products can recover the energy output by DC source-type equipment and return it to the internal power grid without causing pollution. The recovered electrical energy can be directly utilized by internal appliances, reducing the heat generated from energy consumption and achieving a win-win situation of both operation and energy conservation.



Battery test

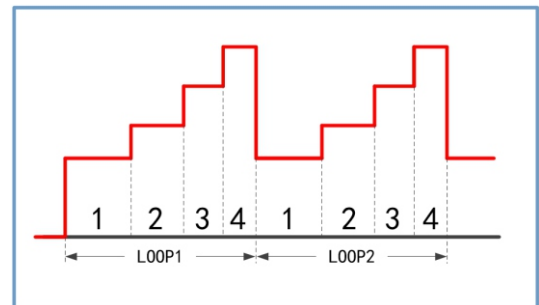
FTR7000 series electronic loads feature battery testing. Three discharge modes of fixed current, fixed resistance and fixed power are provided, and the discharge cutoff conditions can be set by itself: cut-off voltage, cut-off time and cut-off power. If any of the three conditions are met, the discharge stops. During the discharge process, the discharge quantity and discharge time are recorded.

FTR7000 series is tested for internal resistance and capacity by direct current discharge (DCR).



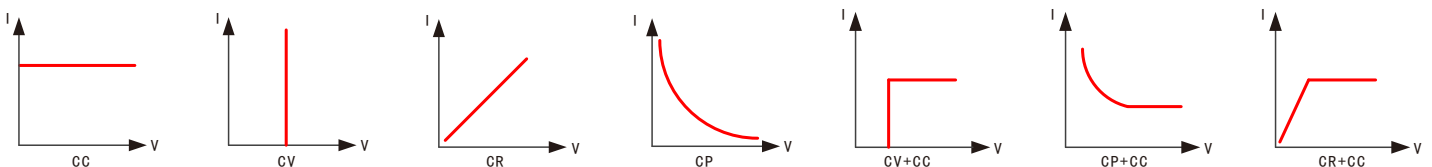
Sequence and waveform function

FTR7000 series electronic load offers a sequence testing function, allowing up to 10 test files to be edited, each with 100 steps. It supports load timing variations in various modes such as CC, CV, CR, and CP, and also supports sequence editing functions like file linking. The maximum sequence editing can complete 100 steps, with the single step time range being from 1ms to 99999s.



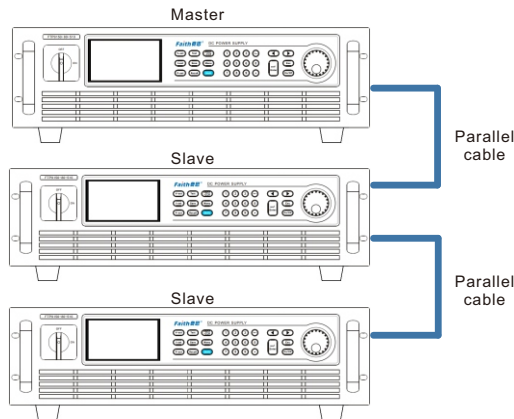
Multiple operating modes

FTR7000 series has four basic operating modes of constant current, constant voltage, constant resistance and constant power, which can meet a wide range of test needs. At the same time, it also has the function of CV+CC, CR+CC, CP+CC multiple composite operation modes. Users can set the current limit value according to their own test requirements to avoid overcurrent damage to the test product during the test process. Among them, CV+CC mode can be applied to simulate battery charging characteristics, test charging piles and similar products such as vehicle chargers. CR+CC mode simulates power supply voltage current limitation and accuracy testing



Master/slave parallel function

The cascading function of the FTR7000 series supports parallel use of up to 10 loads, extending the power usage range of electronic loads. During the cascading process, each load automatically equalizes traffic, and the slave automatically copies the load parameters of the host. Single machine can also be used independently, more flexible power configuration.



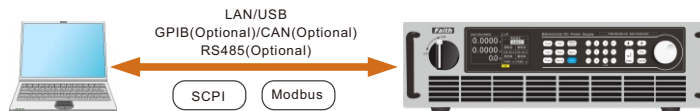
4U/50kW high power density

FTR7000 series feedback-type high-power programmable DC electronic load adopts a high-power density design. Compared with ordinary energy-consuming electronic loads, it reduces the volume by 80% under the same power, making it more flexible and convenient to use.



Multi-interface and Multi-protocol

FTR7000 series is equipped with a variety of communication interfaces, and supports both SCPI and Modbus communication protocols. Users can configure the system on the menu according to their needs, which makes the system integration more flexible.



Graphical touch screen design

FTR7000 series offers a wide range of operation methods and functions, allowing users to perform convenient and efficient operations through a 5-inch touch screen, keyboard and knobs. The simple and intuitive interface directly displays the settings and measurements of various parameters, and provides waveform display and other functions. It has both Chinese and English (traditional) language interfaces, and the user-friendly settings can meet various usage needs of users.



Ordering information

Voltage	Model	Current	Power	Size	Voltage	Model	Current	Power	Size
500V	FTR7050-500-360	360A	50kW	4U	800V	FTR7050-800-225	225A	50kW	4U
	FTR7100-500-720	720A	100kW	8U		FTR7100-800-450	450A	100kW	8U
	FTR7150-500-1080	1080A	150kW	16U		FTR7150-800-675	675A	150kW	16U
	FTR7200-500-1440	1440A	200kW	22U		FTR7200-800-900	900A	200kW	22U
	FTR7250-500-1800	1800A	250kW	28U		FTR7250-800-1125	1125A	250kW	28U
	FTR7300-500-2160	2160A	300kW	28U		FTR7300-800-1350	1350A	300kW	28U
Voltage	Model	Current	Power	Size	Voltage	Model	Current	Power	Size
1000V	FTR7100-1000-360	360A	100kW	8U	1500V	FTR7100-1500-225	225A	100kW	8U
	FTR7200-1000-720	720A	200kW	22U		FTR7150-1500-360	360A	150kW	16U
	FTR7300-1000-1080	1080A	300kW	28U		FTR7200-1500-450	450A	200kW	22U
	/	/	/	/		FTR7300-1500-675	675A	300kW	28U
Voltage	Model	Current	Power	Size	Voltage	Model	Current	Power	Size
2250V	FTR7150-2250-225	225A	150kW	22U	/	/	/	/	/
	FTR7300-2250-450	450A	300kW	28U		/	/	/	/

*Higher power specifications are not listed separately

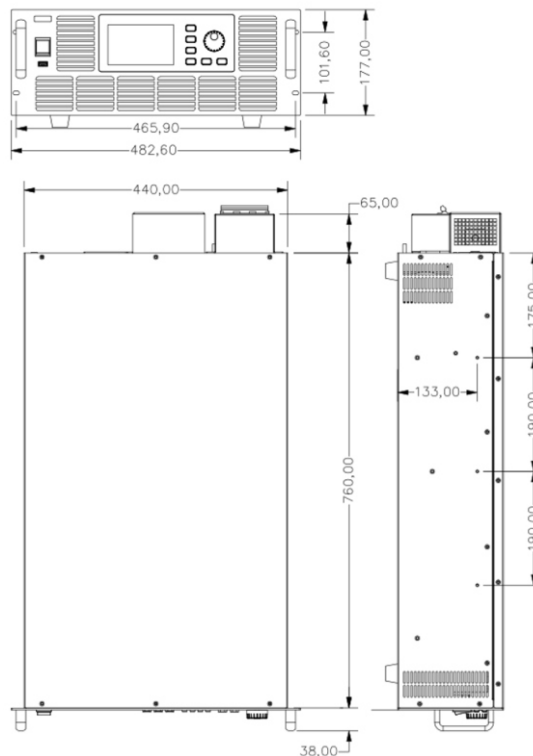
Optional information

Name	Model or specification	Instructions
GPIO Interface	FTR7001B	Choose one: Install before factory shipment
CAN+485 Interface	FTR7001C	
Composite signal port	FTR7001F	Install before factory shipment

*Optional test cables are available. For details about specifications and models, see "Optional Accessories" in this manual.

Dimension

50kW Model Dimension



Specification table-1

Model	FTR7050-500-360	FTR7050-800-225	-	-	-
Voltage	500V	800V	-	-	-
Current	360A	225A	-	-	-
Resistance	0.06~463Ω	0.09~1185Ω	-	-	-
Power	50kW		-	-	-
Minimum on-load voltage	3.1V@360A	2.5V@225A	-	-	-
Current Slope (Max)	180A/ms	112.5A/ms	-	-	-
Model	FTR7100-500-720	FTR7100-800-450	FTR7100-1000-360	FTR7100-1500-225	-
Voltage	500V	800V	1000V	1500V	-
Current	720A	450A	360A	225A	-
Resistance	0.003~231Ω	0.04~593Ω	0.08~926Ω	0.13~2222Ω	-
Power	100kW				-
Minimum on-load voltage	3.1V@720A	2.5V@450A	6.2V@360A	9.3V@225A	-
Current Slope (Max)	360A/ms	225A/ms	180A/ms	112.5A/ms	-
Model	FTR7150-500-1080	FTR7150-800-675	-	FTR7150-1500-360	FTR7150-2250-225
Voltage	500V	800V	-	1500V	2250V
Current	1080 A	675A	-	360A	225A
Resistance	0.02~154Ω	0.03~395Ω	-	0.08~1398Ω	0.13~3333Ω
Power	150kW		-		
Minimum on-load voltage	3.1V@1080A	2.5V@675A	-	9.3V@360A	7.5V@225A
Current Slope (Max)	540A/ms	337.5A/ms	-	180A/ms	112.5A/ms
Model	FTR7200-500-1440	FTR7200-800-900	FTR7200-1000-720	FTR7200-1500-450	-
Voltage	500V	800V	1000V	1500V	-
Current	1440 A	900A	720A	450A	-
Resistance	0.01~116Ω	0.02~296Ω	0.04~463Ω	0.07~1111Ω	-
Power	200kW				-
Minimum on-load voltage	3.1V@1440A	2.5V@900A	6.2V@720A	9.3V@450A	-
Current Slope (Max)	720A/ms	450A/ms	360A/ms	225A/ms	-
Model	FTR7250-500-1800	FTR7250-800-1125	-	-	-
Voltage	500V	800V	-	-	-
Current	1800 A	1125A	-	-	-
Resistance	0.01~93Ω	0.02~237Ω	-	-	-
Power	250kW		-	-	-
Minimum on-load voltage	3.1V@1800A	2.5V@1125A	-	-	-
Current Slope (Max)	900A/ms	562.5A/ms	-	-	-
Model	FTR7300-500-2160	FTR7300-800-1350	FTR7300-1000-1080	FTR7300-1500-675	FTR7300-2250-450
Voltage	500V	800V	1000V	1500V	2250V
Current	2160 A	1350A	1080A	675A	450A
Resistance	0.009~77Ω	0.01~198Ω	0.03~309Ω	0.04~741Ω	0.07~1667Ω
Power	300kW				
Minimum on-load voltage	3.1V@2160A	2.5V@1350A	6.2V@1080A	9.3V@675A	7.5V@450A
Current Slope (Max)	1080A/ms	675A/ms	540A/ms	337.5A/ms	225A/ms
Constant Voltage①					
Resolution	16bits				
Precision	0.05%+0.05%F. S.				
Constant Current①					
Resolution	16bits				
Precision	0.1%+0.2% F. S.				

Specification table-2

Constant Resistance①	
Resolution	0.001Ω
Precision	$V_{in}/R_{set}*(1\%)+0.5\%I.F.S.$
Constant power①	
Resolution	1W
Precision	0.5%F.S.
External analog programming①	
Resolution	0 to 5V corresponds to 0 to 100% Full Scale.
Voltage Precision	0.5%F.S.
Current Precision	0.5%F.S.
Voltage measurement①	
Resolution	16bits
Precision	0.05%+0.05%F.S.
Current measurement①	
Resolution	16bits
Precision	0.1%+0.2% F.S.
Resistance measurement①	
Resolution	0.001Ω
Precision	$V_{in}/R_{set}*(1\%)+0.5\%I.F.S.$
Power measurement①	
Resolution	1W
Precision	0.5%F.S.
Parallel operation	Supports simultaneous expansion of 10 primary and secondary servers of the same model
Protection	Over voltage, over current, over power, over temperature, under voltage, etc
Communication interface	LAN、USB Serial port (assorting GPIB、CAN、RS485)
Communication protocol	SCPI、MODBUS、CAN-Open Protocol (optional)
Input characteristic	
Input voltage	340VAC~480VAC , frequency 45Hz~63Hz
Power factor	0.99(Typical value)
Efficiency	> 93% (Typical value)
Use environment	
Operating temperature	0°C~40°C
Storage temperature	-20°C~70°C
Service altitude	< 2000m
Heat dissipation mode	Air cooling, intelligent risk control
Size (WxHxD)	50kW : 482.6mm x 177mm x 863mm , Includes output guard
Weight	50kW≈65kg