

# EA-PSI 9000 DT 320 W - 1500 W



## 桌面式可编程直流电源 Programmable desktop DC Power supplies



EA-PSI 9080-60 DT



- 宽范围输入电压90...264 V，带主动式PFC
- 效率高达 92%
- 输出功率：0...320 W 至0...1500 W
- 输出电压：0...40 V 至 0...750 V
- 输出电流：0...4 A 至 0...60 A
- 灵活的功率调整输出级
- 监测功能 (OVP, OCP, OPP)
- 过温保护 (OT)
- 触摸屏显示器，显示数值、状态与通知
- 电隔离模拟接口
- 内置USB与模拟端口
- 内置函数发生器
- 可模拟与调整内阻
- 低纹波
- 桌面式外壳配有提手与倾斜支架
- 符合SELV标准 (EN 60950)的40 V产品型号
- 配放电电路(在10 s内 $U_{out} < 60 V$ )
- 支持SCPI指令语言

### 概要

EA-PSI 9000 DT系列是一款由微处理器控制的实验室电源。它立足于用户友好的交互式操作概念，配备一套完整的标准功能。其输出参数、监控功能与其它设定的配置很智能且舒适。

所有输出参数的监控功能，可帮助用户减少测试设备，且几乎可不用安装外部监控硬件与软件。

- **Wide input voltage range 90...264 V with active PFC**
- **High efficiency up to 92%**
- **Output power ratings: 0...320 W up to 0...1500 W**
- **Output voltages: 0...40 V up to 0...750 V**
- **Output currents: 0...4 A up to 0...60 A**
- **Flexible, power regulated output stage**
- **Supervision (OVP, OCP, OPP)**
- **Overtemperature protection (OT)**
- **Intuitive touch panel with display for values, status and notifications**
- **Galvanically isolated analog interface**
- **USB port and Ethernet built in**
- **Integrated function generator**
- **Internal resistance simulation and regulation**
- **Low ripple**
- **Desktop enclosure with carrying handle and tilt stand**
- **40 V models compliant to SELV (EN 60950)**
- **Discharge circuit ( $U_{out} < 60 V$  in  $\leq 10 s$ )**
- **SCPI command language supported**

### General

The microprocessor controlled laboratory power supplies of series EA-PSI 9000 DT offer a user-friendly, interactive handling concept, along with an extensive set of standard features, which can facilitate operating them. Configuration of output parameters, supervision features and other settings is smart and comfortable.

The implemented supervision features for all output parameters can help to reduce test equipment and make it almost unnecessary to install external supervision hardware and software.

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由两旋钮，一个按键，三个LED以及彩色触摸屏组成的控制面板，显示所有关键数值与状态，用户只需轻轻一点手指，就可轻松操作本设备。

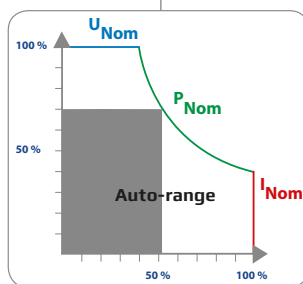
若要集成到半自动与远程控制的自动化测试系统中，在其背面提供有一组接口（模拟和数字均可）。

### 交流输入

本系列采用主动式功率因数（简称：PFC），输入电压为90 V<sub>AC</sub>至264 V<sub>AC</sub>，适合全球范围内使用。1.5 kW的型号在供电电压<150 V<sub>AC</sub>时，输出功率自动减少到1 kW。

### 功率级自动调整

本系列所有型号的输出功率都可灵活调整。可在较低电流时输出较高电压，或在低电压时输出较高电流，但总是维持在最大额定输出功率范围内。其最大设定功率可调，因此仅用一台产品就能覆盖广泛的应用。



### 直流输出

本系列有0...40 V和0...750 V输出电压，0...4 A和0...60 A输出电流，0...320 W和0...1500 W输出功率的不同型号。

因此不管是手动控制还是远程控制（模拟或数字），都可在0%与100%之间连续调节电流、电压与功率。它还有一内阻模式，能模拟一内部在线电阻。

输出端位于产品后面板上。

与其它系列电源相比，PSI 9000 DT还内置有一个额外的输出滤波器，可使纹波更低，即：输出电压的噪音更低。

### 放电电路

额定输出电压为200 V或以上的产品，其输出电容都配有一放电电路。在空载或带小负载时，它能确保危险电压在直流输出关闭后降至60 V DC以下。该电压值被认为是对人体安全的最高电压。

### 保护功能

为保护连接设备，可给产品设定一过压保护极限值(OVP)，以及过流(OCP)与过功率(OPP)保护极限值。

一旦因故超过这三个值中的一个，直流输出会被立即切断，并在显示器与接口端发出一状态信号。本产品还有过温保护，如果产品过热，它会关断直流输出。

### 远程感测

远程感测输入端可直接连到负载设备，以补偿连线上的部分压降。如果感测输入端已接到负载上，本电源会自动调整输出电压，以确保负载获得准确所需的电压值。

The clear control panel with its two knobs, one pushbutton, two LEDs and the touch panel with colour display for all important values and status enable the user to handle the device easily with a few touches of a finger.

For the integration into semi-automatic and remotely controlled test and automation systems, the devices offer a set of interfaces (analog and digital) on their rear side.

### AC input

The equipment uses an active Power Factor Correction (short: PFC), enabling worldwide use on a mains input from 90 V<sub>AC</sub> up to 264 V<sub>AC</sub>. Models with 1.5 kW will derate their output power to 1 kW below input voltages of 150 V<sub>AC</sub>.

### Auto-ranging power stage

All models are equipped with a flexible auto-ranging output stage which provides a higher output voltage at lower output current, or a higher output current at lower output voltage, always limited to the max. nominal output power. The maximum power set value is adjustable with these models. Therefore, a wide range of applications can already be covered by the use of just one unit.

### DC output

DC output voltages between 0...40 V and 0...750 V, output currents between 0...4 A and 0...60 A and output power ratings between 320 W and 0...1500 W are available.

Current, voltage and power can thus be adjusted continuously between 0% and 100%, no matter if manually or remotely controlled (analog or digital). The output terminals are located on the front side of the devices.

Compared to other power supply series, the PSI 9000 DT feature a built-in, additional output filter to achieve much lower ripple, i. e. low noise on the DC output voltage.

### Discharge circuit

Models with a nominal output voltage of 200 V or higher include a discharge circuit for the output capacities. For no load or low load situations, it ensures that the dangerous output voltage can sink to under 60 V DC after the DC output has been switched off. This value is considered as limit for voltages dangerous to human safety.

### Protective features

For protection of the equipment connected, it is possible to set an overvoltage protection threshold (OVP), as well as one for overcurrent (OCP) and overpower (OPP).

As soon as one of these thresholds is reached for any reason, the DC output will be immediately shut off and a status signal will be generated on the display and via the interfaces. There is furthermore an overtemperature protection, which will shut off the DC output if the device overheats.

### Remote sensing

The standard sensing input can be connected directly to the load in order to compensate voltage drops along the cables. If the sensing input is connected to the load, the power supply will detect this and adjust the output voltage automatically to ensure the accurate required voltage is available at the load.

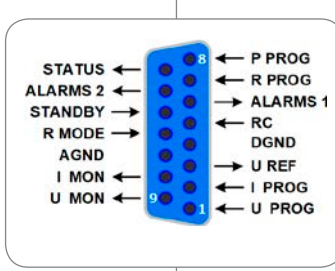


# EA-PSI 9000 DT 320 W - 1500 W



### 内置模拟接口

产品后板上装有一隔离模拟接口端子。它具有一模拟输入脚，接上0 V...10 V或0 V...5 V电压，可设置0...100%的输出电压、电流与功率。要监控输出电压与电流，可给模拟输出脚接上0 V...10 V或0 V...5 V来完成。此外，还有几个输入脚和输出脚，可用来控制和监控产品状态。



### Built-in analog interface

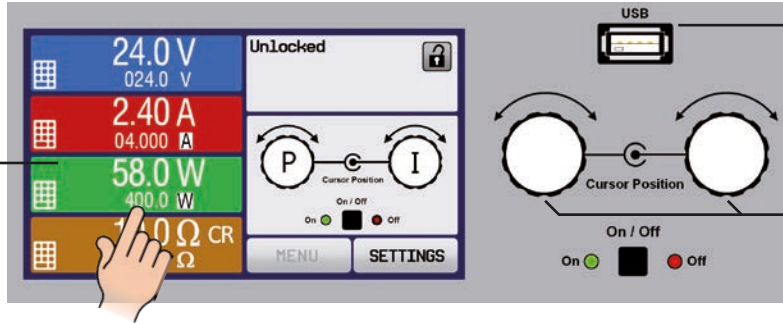
There is a galvanically isolated analog interface terminal, located on the rear of the device. It offers analog inputs to set voltage, current, power and resistance from 0...100% through control voltages of 0 V...10 V or 0 V...5 V. To monitor the output voltage and current, there are analog outputs with 0 V...10 V or 0 V...5 V. Also, several inputs and outputs are available for controlling and monitoring the device status.



### 显示器与控制面板



触摸屏显示器  
Display with touch panel



上载和保存函数用USB端口  
USB port for loading and saving functions

参数调节用旋钮  
Knobs for comfortable value adjustment

设定与实际输出电压、电流与功率都清晰显示于图形显示器上。彩色的TFT屏幕为点触式，用一个手指就能控制所有功能。

Set values and actual values of output voltage, output current and output power are clearly represented on the graphic display. The colour TFT screen is touch sensitive and can be intuitively used to control all functions of the device with just a finger.

通过旋钮或者数字键盘直接输入参数，也可调节设定电压、电流、功率或阻值（内阻模拟）。

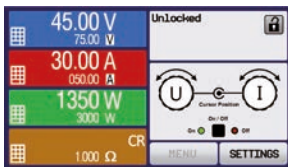
Set values of voltage, current, power or resistance (internal resistance simulation) can be adjusted using the rotary knobs or entered directly via a numeric pad.

若想防止意外操作，可锁定所有操作键。

To prevent unintentional operations, all operation controls can be locked.

### 多语言控制面板

### Multi-language control panel



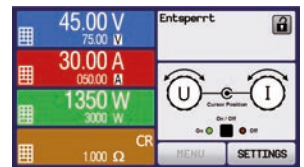
英文 / English



中文 / Chinese



俄文 / Russian



德文 / German

### 函数发生器

本系列所有型号都具有一可形成如下典型函数的真实函数发生器，并能将它们应用于输出电压或输出电流上。发生器可通过前板的触摸屏设置，或经某一数字接口远程配置。

### Function generator

All models within this series include a true function generator which can generate typical functions, as displayed in the figure below, and apply them to either the output voltage or the output current. The generator can be completely configured and controlled by using the touch panel on the front of the device, or by remote control via one of the digital interfaces.

预设函数会为用户提供所有必须的参数，如Y偏差值，时间/频率或幅度，整套配置完成。

The predefined functions offer all necessary parameters to the user, such as Y offset, time / frequency or amplitude, for full configuration ability.



三角形  
Triangle



矩形  
Rectangle



梯形  
Trapezoid



正弦  
Sine



阶跃  
Ramp

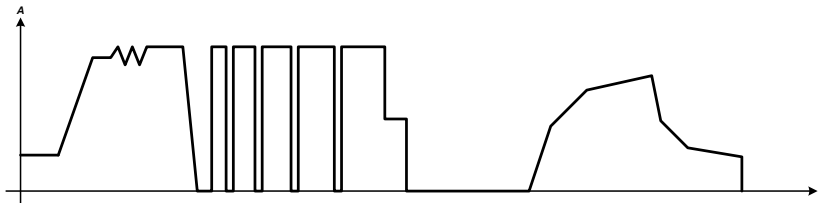


DIN 40839

## EA-PSI 9000 DT 320 W - 1500 W

除了基于任意发生器产生的标准函数外，它还可形成某些复杂的函数，并能分成多达99组序列。这些可用于研发和生产的测试。通过前板的USB端口可将这些序列上载使用或存储于标准U盘上，这样方便更换不同的测试序列。

下图是任意发生器可实现的由40个序列组成的复杂曲线，仅为虚构范例。可以在产品外或者于产品上创建函数，然后上载或保存：



Additionally to the standard functions, which are all based upon a so-called arbitrary generator, this base generator is accessible for the creation and execution of complex sets of functions, separated into up to 99 sequences. These can be used for testing purposes in development and production.

The sequences can be loaded from and saved to a standard USB flash drive via the USB port on the front panel, making it easy to change between different test sequences.

Fictional example of a complex function (40 sequences) as it can be realised with the arbitrary generator. The function can be created on the device or externally and then loaded or saved:



### 输出值的预设

设定输出值不会对输出状态有直接影响。它显示于显示器上，就在实际值下方。

利用该特性，用户可通过旋钮或触摸屏上直接输入参数，预设所需的电压、电流和功率。还有5个用户配置文档，能让用户在常用设定值之间简便地转换，激活不同的配置文档即可完成。

### 监控功能

本系列都有电压与电流监控功能，且可配置成监控电压或电流是否过冲与下冲。作为反应，产品会以下列可选类型生成一个通知：

- 只显示信号；即使错误仍存在，也不影响输出。
- 警告一直持续，故障排除后必须确认该警告信息。
- 报警会暂时关断输出。

### 控制软件

本产品还配有适合Windows系统操作的控制软件，可远程控制多台同型号产品，甚至不同型号。它有一个清晰的主界面，显示所有设定值与实际值，SCPI与ModBus RTU指令的直接输入模式，固件升级，以及被称为“排序”的半自动化控制表格。产品还可用注册码解锁，用“多功能控制”应用在一个窗口下一次性监控多达20台产品。此时还能使用排序与数据记录功能。

### Presetting of output values

To set output values without a direct impact on the output condition, the set values are also shown on the display, positioned below the actual values.

With this, the user can preset required values for voltage, current and power. It is either done by using the rotary knobs or by direct input on the touch panel. The five user profiles furthermore enable the user to switch easily between often used set values, just by activating a different user profile.

### Supervision features

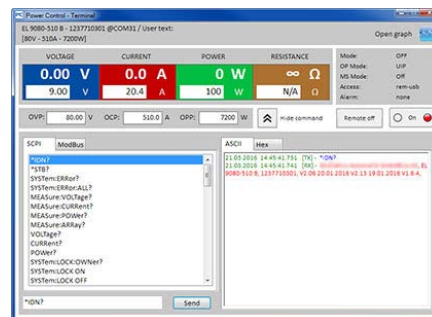
All models offer supervision features for voltage and current steps. The supervision is configurable to monitor voltage or current over- and under-shooting. As a reaction, the device can generate a notification of selectable type:

- Signals are displayed only; even if the fault is still active, without affecting the output
- Warnings remain active and must be acknowledged after the fault is removed
- Alarms will instantly shut off the output

### Control software

Included with the device is a control software for Windows PC, which allows for the remote control of multiple identical or even different types of devices. It has a clear interface for all set and actual values, a direct input mode for SCPI and ModBus RTU commands, a firmware update feature and the semi-automatic table control named “Sequencing”.

Optionally unlockable with a licence code, the app “Multi Control” can monitor and control up to 20 units at once and in one windows. The sequencing feature and data logging are here available as well.



# EA-PSI 9000 DT 320 W - 1500 W



技术参数	Technical Data	Series EA-PSI 9000 DT / 系列	
交流: 供电	AC: Supply		
- 电压	- Voltage	90...264 V, 1ph+N	
- 频率	- Frequency	45...65 Hz	
- 功率因数	- Power factor	>0.99	
- 功率降额	- Derating	型号 / Models 1500 W: < 150 V AC 降至 / to P <sub>out max</sub> 1000 W	
直流: 电压	DC: Voltage		
- 精确度	- Accuracy	<额定值的0.1% / <0.1% of rated value	
- 0-100%的负载调整率	- Load regulation 0-100%	<额定值的0.05% / <0.05% of rated value	
- ±10% ΔU <sub>AC</sub> 线性调整率	- Line regulation ±10% ΔU <sub>AC</sub>	<额定值的0.02% / <0.02% of rated value	
- 带载10-100%调整需时	- Regulation 10-100% load	<2 ms	
- 带载10-90%上升时间	- Rise time 10-90%	最大 / Max. 30 ms	
- 过压保护	- Overvoltage protection	可调, 0...110% U <sub>Nenn</sub> / Adjustable, 0...110% U <sub>Nom</sub>	
直流: 电流	DC: Current		
- 精确度	- Accuracy	<额定值的0.1% / <0.2% of rated value	
- 1-100% ΔI <sub>DC</sub> 的负载调整率	- Load regulation 1-100% ΔI <sub>DC</sub>	<额定值的0.15% / <0.15% of rated value	
- ±10% ΔU <sub>AC</sub> 的线性调整率	- Line regulation ±10% ΔU <sub>AC</sub>	<额定值的0.05% / <0.05% of rated value	
直流: 功率	DC: Power		
- 精确度	- Accuracy	<额定值的1% / <1% of rated value	
过压类别	Overvoltage category	2	
保护功能	Protection	OT, OVP, OCP, OPP, PF <sup>2</sup>	
隔离耐压	Insulation		
- 交流输入对外壳	- AC input to enclosure	2500 V DC	
- 交流输入对直流输出	- AC input to DC output	2500 V DC	
- 直流输出对外壳 (PE)	- DC output to enclosure	负极: 最大400 V DC, 正极: 最大400 V DC + 输出电压 / Negative: max. 400 V DC, positive: max. 400 V DC + output voltage	
污染等级	Degree of pollution	2	
保护等级	Protection class	1	
数字接口	Digital interfaces	1x B类USB端口 (通讯用) / 1x USB type B (for communication) 1x A类USB端口 (存储设备用) / 1x USB type A (for storage device) 1x Ethernet	
模拟接口	Analog interface	内置15-针D-Sub母插, 电隔离 / Built in, 15-pole D-Sub (female), galvanically isolated	
- 信号范围	- Signal range	0...5 V 或 0...10 V (可切换) / 0...5 V or 0...10 V (switchable)	
- 输入脚	- Inputs	U, I, P, R, 远程开-关, 直流输出开-关, 内阻模式开-关 / U, I, P, R, Remote on-off, DC output on-off, resistance mode on-off	
- 输出脚	- Outputs	U / I, 过压, 报警, 参考电压 / U / I, Overvoltage, alarms, reference voltage	
- 精确度	- Accuracy	0...10 V: <0.2%	0...5 V: <0.4%
并联操作	Parallel operation	可实现 / Possible	
安规标准	Standards	EN 60950, EN 61326, EN 61010, EN 55022 等级 B / Class B	
制冷方式	Cooling	温控风扇 / Temperature controlled fan	
工作温度	Operation temperature	0...50 °C	
储存温度	Storage temperature	-20...70 °C	
相对湿度	Relative humidity	<80%, 无凝露 / non-condensing	
工作高度	Operation altitude	<2000 m	
机械结构	Mechanics		
- 重量	- Weight	320 W - 650 W: ~ 7.5 kg	1000 W - 1500 W: ~ 8.2 kg
- 尺寸 (宽 高 深) <sup>(1)</sup>	- Dimensions (W x H x D) <sup>(1)</sup>	320 W - 650 W: 308 x 103 x 355 mm	1000 W - 1500 W: 308 x 103 x 415 mm

(1) 仅为机身尺寸 / Body only  
(2) 也可见第146页 / See page 146

## EA-PSI 9000 DT 320 W - 1500 W

型号	电压	电流	功率	效率	U的纹波 <sup>(2)</sup>	I的纹波 <sup>(2)</sup>	编程 <sup>(1)</sup>			订购编号
Model	Voltage	Current	Power	Efficiency	Ripple U <sup>(2)</sup>	Ripple I <sup>(2)</sup>	U (typ.)	I (typ.)	P (typ.)	Ordering number
PSI 9040-20 DT	0...40V	0...20 A	0...320 W	≤88%	8 mV <sub>pp</sub> / 0.8 mV <sub>RMS</sub>	1 mA <sub>RMS</sub>	1.5 mV	0.8 mA	0.012 W	06200500
PSI 9080-10 DT	0...80V	0...10 A	0...320 W	≤89%	8 mV <sub>pp</sub> / 0.8 mV <sub>RMS</sub>	1 mA <sub>RMS</sub>	3.1 mV	0.4 mA	0.012 W	06200501
PSI 9200-04 DT	0...200V	0...4 A	0...320 W	≤89%	20 mV <sub>pp</sub> / 2.5 mV <sub>RMS</sub>	1.5 mA <sub>RMS</sub>	7.6 mV	0.2 mA	0.012 W	06200502
PSI 9040-40 DT	0...40V	0...40 A	0...640 W	≤89%	8 mV <sub>pp</sub> / 0.8 mV <sub>RMS</sub>	1 mA <sub>RMS</sub>	1.5 mV	1.5 mA	0.024 W	06200503
PSI 9080-20 DT	0...80V	0...20 A	0...640 W	≤91%	8 mV <sub>pp</sub> / 0.8 mV <sub>RMS</sub>	1 mA <sub>RMS</sub>	3.1 mV	0.8 mA	0.024 W	06200504
PSI 9200-10 DT	0...200V	0...10 A	0...640 W	≤92%	20 mV <sub>pp</sub> / 2.5 mV <sub>RMS</sub>	1.5 mA <sub>RMS</sub>	7.6 mV	0.4 mA	0.024 W	06200505
PSI 9040-40 DT	0...40V	0...40 A	0...1000 W	≤92%	10 mV <sub>pp</sub> / 1.5 mV <sub>RMS</sub>	6 mA <sub>RMS</sub>	1.5 mV	1.5 mA	0.038 W	06200517
PSI 9080-40 DT	0...80V	0...40 A	0...1000 W	≤92%	10 mV <sub>pp</sub> / 1.5 mV <sub>RMS</sub>	6 mA <sub>RMS</sub>	3.1 mV	1.5 mA	0.038 W	06200506
PSI 9200-15 DT	0...200V	0...15 A	0...1000 W	≤93%	60 mV <sub>pp</sub> / 9 mV <sub>RMS</sub>	1.8 mA <sub>RMS</sub>	7.6 mV	0.6 mA	0.038 W	06200507
PSI 9360-10 DT	0...360V	0...10 A	0...1000 W	≤93%	58 mV <sub>pp</sub> / 11 mV <sub>RMS</sub>	2 mA <sub>RMS</sub>	13.7 mV	0.4 mA	0.038 W	06200508
PSI 9500-06 DT	0...500V	0...6 A	0...1000 W	≤93%	62 mV <sub>pp</sub> / 13 mV <sub>RMS</sub>	8 mA <sub>RMS</sub>	19.1 mV	0.2 mA	0.038 W	06200509
PSI 9750-04 DT	0...750V	0...4 A	0...1000 W	≤93%	94 mV <sub>pp</sub> / 16 mV <sub>RMS</sub>	10 mA <sub>RMS</sub>	28.6 mV	0.2 mA	0.038 W	06200510
PSI 9040-60 DT	0...40V	0...60 A	0...1500 W	≤92%	10 mV <sub>pp</sub> / 1.5 mV <sub>RMS</sub>	6 mA <sub>RMS</sub>	1.5 mV	2.3 mA	0.057 W	06200516
PSI 9080-60 DT	0...80V	0...60 A	0...1500 W	≤92%	10 mV <sub>pp</sub> / 1.5 mV <sub>RMS</sub>	6 mA <sub>RMS</sub>	3.1 mV	2.3 mA	0.057 W	06200511
PSI 9200-25 DT	0...200V	0...25 A	0...1500 W	≤93%	60 mV <sub>pp</sub> / 9 mV <sub>RMS</sub>	1.8 mA <sub>RMS</sub>	7.6 mV	1 mA	0.057 W	06200512
PSI 9360-15 DT	0...360V	0...15 A	0...1500 W	≤93%	58 mV <sub>pp</sub> / 11 mV <sub>RMS</sub>	2 mA <sub>RMS</sub>	13.7 mV	0.6 mA	0.057 W	06200513
PSI 9500-10 DT	0...500V	0...10 A	0...1500 W	≤93%	62 mV <sub>pp</sub> / 13 mV <sub>RMS</sub>	8 mA <sub>RMS</sub>	19.1 mV	0.2 mA	0.057 W	06200514
PSI 9750-06 DT	0...750V	0...6 A	0...1500 W	≤93%	94 mV <sub>pp</sub> / 16 mV <sub>RMS</sub>	10 mA <sub>RMS</sub>	28.6 mV	0.2 mA	0.057 W	06200515

(1) 忽略产品错误时的可编程分辨率 / Programmable resolution disregarding device errors

(2) RMS值: 在BWL 300 kHz时测量的LF值, PP值: 在BWL 20MHz时测量的HF值 / RMS value: measures at LF with BWL 300 kHz, PP value: measured at HF with BWL 20MHz

### 产品图片

### Product views

