

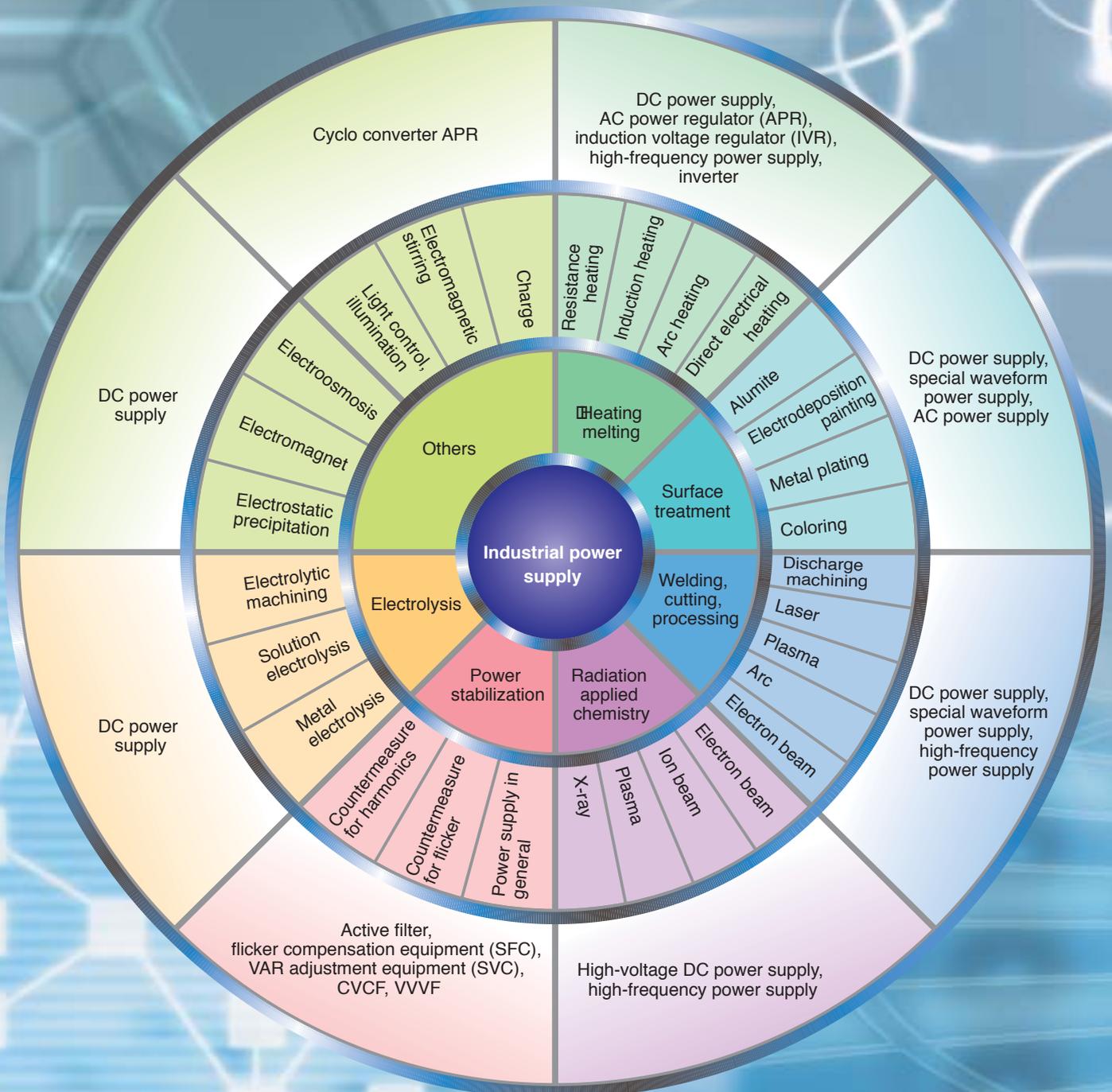
Fuji Industrial Power Supply



Fuji Electric Co., Ltd.

Alternate Fuji industrial power supply options

Fuji Electric provides alternate types of industrial power supplies with high performance and reliability. It meets ever diversifying customer needs through abundant expertise and lengthy experience in semiconductor converters and the latest power electronics.



Fuji industrial power supplies come in many shapes and sizes and have an equally wide range of applications.

The following table indicates the typical types and applications of industrial power supplies manufactured by Fuji Electric.

Classification	Type	Rated values	Application
DC power supply (rectifier)	Alumite	Input: 3 ϕ 400/440V 3/3.3kV 6/6.6kV 50/60Hz Output: DC 5 to 25V 2000 to 30000A	Aluminum sash
	Electrodeposition painting	Input: 3 ϕ 400/440V 3/3.3kV 6/6.6kV 50/60Hz Output: DC 50 to 300V 500 to 3000A	Sash coloring, automobile
	Metal plating power supply	Input: 3 ϕ 200/220V 400/440V 50/60Hz Output: DC 6 to 50V 200 to 25000A	Steel sheet plating, copper plating
	Electrolysis	Input: 3 ϕ 400/440V 50/60Hz Output: DC 10 to 700V 1000 to 15000A	Chlorine, fluorine
	Ionitridizing	Input: 3 ϕ 200/220V 400/440V 50/60Hz Output: DC 5 to 150kW	Steel surface treatment
	Metal electrolysis	Input: 3 ϕ 400/440V 50/60Hz Output: DC 20 to 300V 10000 to 35000A	Copper electrolysis, zinc, manganese, lead
	Electrolytic machining	Input: 3 ϕ 400/440V 50/60Hz Output: DC 4 to 15.5V 30 to 200kW	Machine tool
	DC heating	Input: 3 ϕ 400/440V 50/60Hz Output: DC 50 to 100V 150 to 250kW	Monocrystallization
	DC arc furnace	Input: 3 ϕ 3.3kV 6.6kV 50/60Hz Output: DC 250 to 550V 1000 to 7000A	Melting, heating, ash melting
	General DC power supply	Input: 3 ϕ 200/220V 50/60Hz Output: DC 10 to 200V 100 to 1000A	
DC power supply (FASREC)	Alumite	Input: 3 ϕ 400/440V 50/60Hz Output: DC 5 to 25V 2000 to 10000A	Aluminum sash
	Metal plating power supply	Input: 3 ϕ 400/440V 50/60Hz Output: DC 5 to 50V 2000 to 10000A	Copper sheet plating
	Electrolysis	Input: 3 ϕ 400/440V 50/60Hz Output: DC 5 to 50V 2000 to 10000A	Chlorine
	Metal electrolysis	Input: 3 ϕ 400/440V 50/60Hz Output: DC 5 to 50V 2000 to 10000A	Copper electrolysis
	DC heating	Input: 3 ϕ 400/440V 50/60Hz Output: DC 5 to 55V 100 to 300kW	Monocrystal, electric furnace
DC power supply (chopper)	Plasma arc heating	Input: 3 ϕ 3.3kV 6.6kV 50/60Hz Output: DC 400 to 550V 2000 to 11000A	Ash melting
AC power regulation (APR) (IVR)	Electric furnace	Input: 1/3 ϕ 200/220V 400/440V 50/60Hz Output: 1/3 ϕ 1 to 1000kVA	Graphitization furnace, carbon furnace
	Heating	Input: 1/3 ϕ 200/220V 400/440V 50/60Hz Output: 1/3 ϕ 1 to 200kVA	Resistance heater
	Light control	Input: 3 ϕ 400/440V 50/60Hz Output: 1 ϕ 20 to 100kVA	Outdoor illumination and display
	Glass melting	Input: 3 ϕ 3.0/3.3kV 50/60Hz Output: 1 ϕ 200 to 2000kVA	Glass melting
	AC coloring	Input: 1 ϕ 200/220V 400/440V 6.0/6.6kV Output: 1 ϕ 20 to 60V 1000 to 20000A	Aluminum sash coloring
Special waveform power supply	AC coloring (UNICOL process)	Input: 3 ϕ 400/440V 50/60Hz Output: 1000 to 3000A	Aluminum sash coloring
Special waveform power supply (Large-capacity arbitrary-waveform output power supply)	AC coloring	Input: 3 ϕ 3.3kV 6.6kV 50/60Hz Output: \pm 50V 100 to 10000A	Aluminum sash
	Heating	Input: 3 ϕ 3.3kV 6.6kV 440V 50/60Hz Output: 1 ϕ 200 to 2000kW	Electric furnace
APR unit	Intermittent cycle control APR	Input: 1 ϕ 200/220V 400/440V 50/60Hz Output: 1 ϕ 25 to 600A (in series)	Glass annealing, processing heating
	3-phase forward/reverse connection APR	Input: 3 ϕ 200/220V 400/440V Output: 3 ϕ 25 to 1000A (in series)	Heating DC power supply



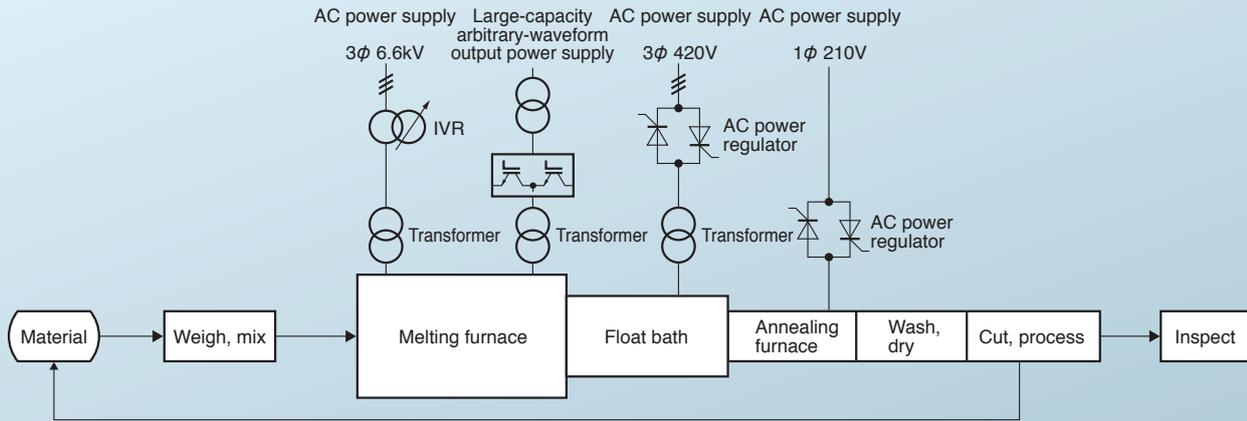
▲DC power supply for electrolysis
Input: 3 ϕ , 6.6kV, 50Hz
Output: 80V DC, 60,000A



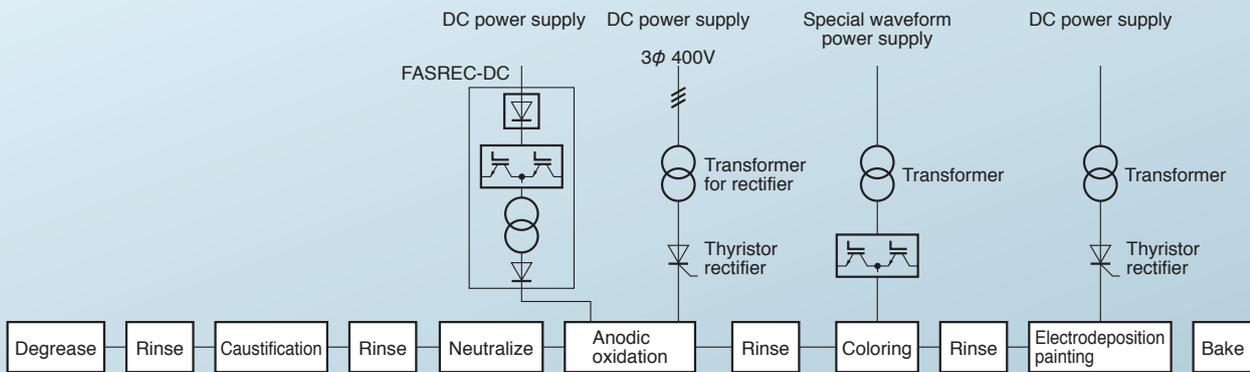
▲Large-capacity arbitrary-waveform output power supply
Input: 3 ϕ , 6.6kV, 60Hz
Output: \pm 50V, 10,000A

Typical applications

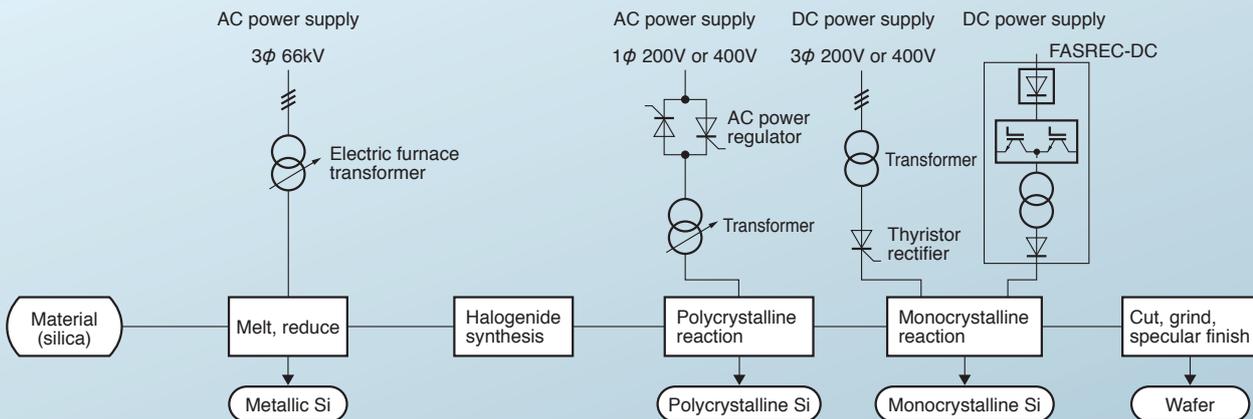
For glass pane melting

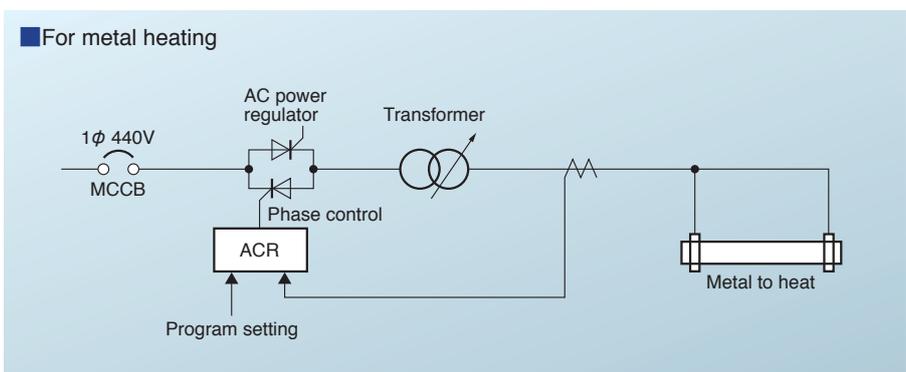
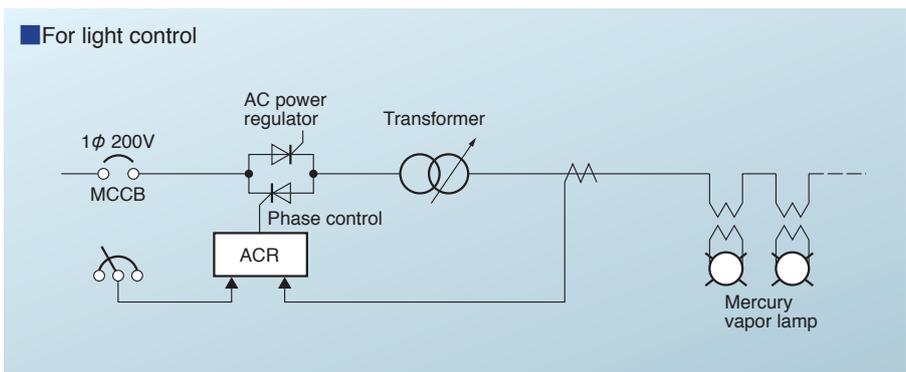
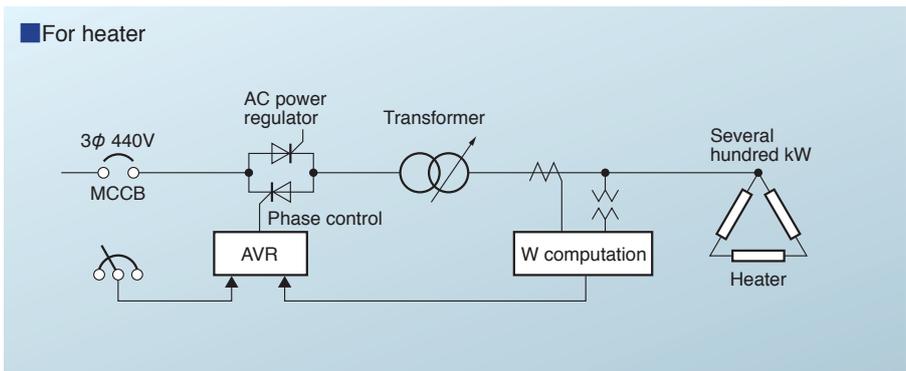
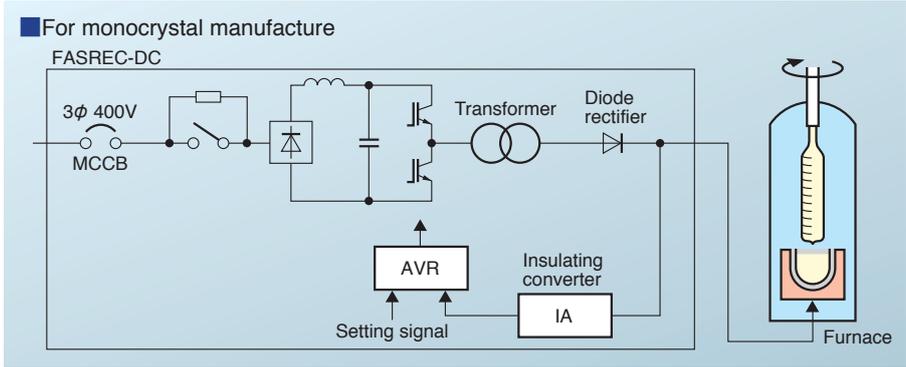


For aluminum sash surface treatment



For semiconductor silicon manufacture





▲ DC power supply for heating
(enclosed type FASREC)
Input: 3 ϕ , 440V, 60Hz
Output: 50V DC, 6,000A



▲ Thyristor rectifier for ash melting
Input: 3 ϕ , 6.6kV, 60Hz
Output: 585V DC, 4,500A

High-current DC power supply (thyristor rectifier)

Fuji manufacture small-capacity thyristor rectifiers for aluminum surface treatment (alumite treatment, electrodeposition), metal plating, electrolysis, electrodeposition painting, etc. as well as large-capacity models for soda electrolysis, metal electrolysis, burnt ash melting, etc.

Features

● High reliability

A very high level of reliability is achieved, due to stringent quality control during manufacture; based on abundant experience and techniques.

● Compact structure

The rectifier, transformer and control unit are compactly integrated, taking up less than half the space of a conventional equivalent unit during installation.

● High efficiency and high power factor

The integration of the rectifier and transformer allows most of the bus bars between them to be dispensed with, leading to a corresponding improvement in the efficiency and power factor.

● Easy maintenance and checkup

The configuration of units standardized by functions facilitates maintenance and checkup.

● Use of a water cooling type model

A water cooling type model with high cooling efficiency is adopted as a standard; this instrument is not affected by the surrounding environment.

Applications and specifications

Application	Input	Output
Electrolysis, alumite treatment, metal plating, electrolytic machining, electrolytic washing, electrodeposition	AC 3 ϕ , 220V, 440V, 3.3 to 220kV	5 to 1500V DC, 1 to 150kA

Typical appearance



▲ Large-capacity DC power supply for electrolysis (S-Former)
Input: 3 ϕ , 69kV, 60Hz
Output: 407V DC, 147,000A



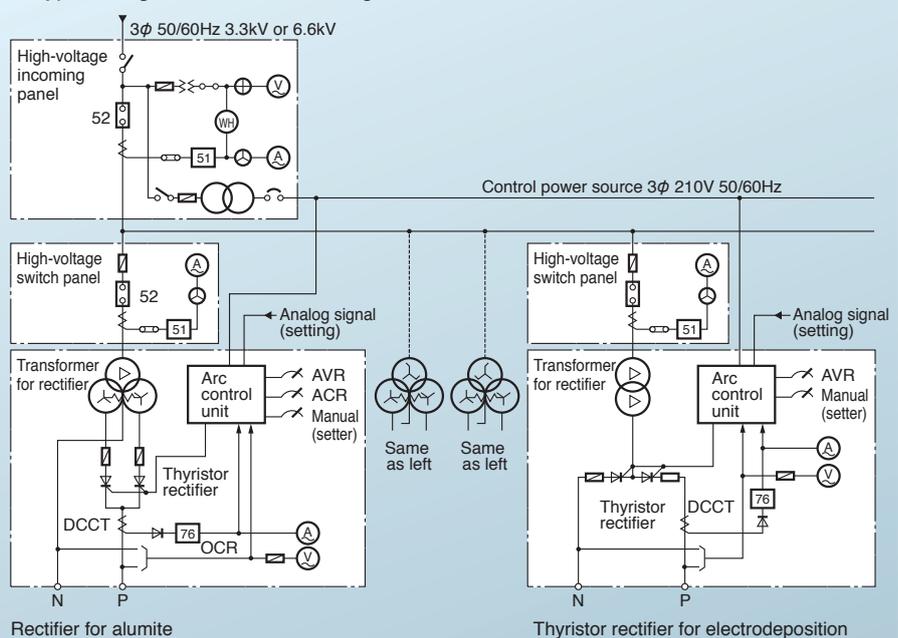
▲ DC power supply for electrolysis (rectifier placed on side)
Input: 3 ϕ , 22kV, 60Hz
Output: 35V DC, 35,000A



▲ DC power supply for electrolysis (rectifier mounted on top)
Input: 3 ϕ , 6.6kV, 50Hz
Output: 80V DC, 60,000A

Typical circuit configuration

■ Typical single line connection diagram for aluminum surface treatment line



AC power regulator

Thyristor AC power regulators are manufactured for glass melting, heat treatment, metal heating, drying furnace, plastic processing, food processing, agro-fishery industries, air conditioning and other electric heating controls.

General purpose as well as custom built models are available to order.

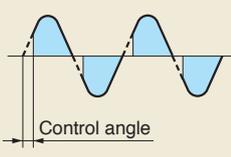
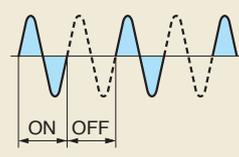
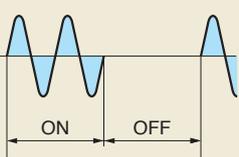
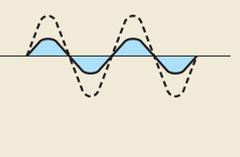
Features

● Wide range of control types

4 different control types are available to suit various requirements.

● Compact and lightweight structure

● High reliability

Control type	Phase control	Intermittent cycle control	Continuous cycle control	PWM control
(1) Circuit type	Single-phase inverse parallel Three-phase mixed inverse parallel Three-phase pure inverse parallel	Single-phase inverse parallel	Single-phase inverse parallel Three-phase mixed inverse parallel	IGBT used Single-phase inverse parallel Three-phase inverse parallel
(2) Output voltage waveform				
(3) Output voltage regulation range	0 to 98%	0 to 100%	0 to 100%	0 to 98%
(4) Particularities	<ul style="list-style-type: none"> ●Quick response control is available. ●Step-less control is available. ●Voltage and current can be auto-controlled. ●Harmonic current flows. 	<ul style="list-style-type: none"> ●Harmonic current does not flow. ●High power factor. ●Use for loads ranging from small to large thermal capacities. ●Basically consists of a digital control circuit. 	<ul style="list-style-type: none"> ●Harmonic current does not flow. ●High power factor. ●Optimum for a load with a comparatively large thermal capacity. 	<ul style="list-style-type: none"> ●Harmonic current does not flow. ●Control with a power factor of 1 is available. ●Use for loads of small to large thermal capacities.

Applications and specifications

Application	Input	Rated current
Glass melting and processing, metal heating and melting, aluminum sash coloring, plastic processing, food processing	AC 3 ϕ , 3.3kV,	Phase control type: 1 ϕ 20 to 600A
	6.6kV,	Phase control type: 3 ϕ 20 to 600A
	200/220V,	Continuous cycle control type: 1 ϕ 20 to 600A
	400/440V	Continuous cycle control type: 3 ϕ 20 to 450A
	50/60Hz	Intermittent cycle control type: 1 ϕ 20 to 600A
		PWM control type: 1 ϕ 80 to 160A
		PWM control type: 3 ϕ 40 to 160A

Typical appearance



▲AC power regulator for resistance heating

Input: 1 ϕ , 400V, 50Hz
Output: 1 ϕ , 300V, 1,000A

▲APR unit

IGBT inverter type DC power supply (FASREC-DC)

IGBT inverter type DC power supply (FASREC-DC) is manufactured for semiconductor heating systems, alumite treatment and other low-voltage high-current applications.

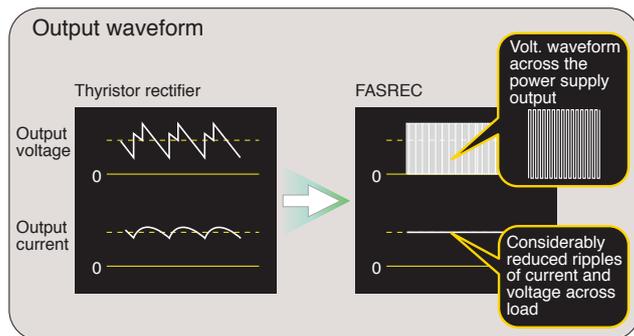
Features

● High power factor

When a thyristor rectifier is used, lowering the output voltage reduces the input power factor. With FASREC, on the other hand, the power factor remains 0.9 or higher, even when the output voltage is lowered.

● Low-ripple output

Because of the high-frequency inverter type, the output current ripple is suppressed to less than one tenth that of the thyristor rectifier.



● Compact design

The use of a high-frequency inverter is the key to the compact design of the transformer and instrument, taking up less than half the space of a thyristor rectifier.

● Quick response

The use of a high-frequency inverter allows high speed control.

Applications and specifications

Application	Input	Output
Alumite treatment, metal plating	3 ϕ , 400/440V, 50/60Hz	10 to 25V DC, 10000A
Heating	3 ϕ , 400/440V, 50/60Hz	10 to 55V DC, 300kW

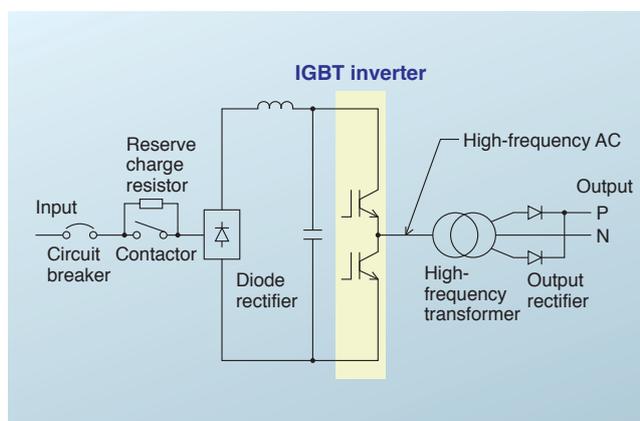
Typical appearance



▲ FASREC-DC for metal-surface treatment

Input: 3 ϕ , 380V, 50Hz
Output: 30V DC, 8,000A

Typical circuit configuration



Large-capacity arbitrary-waveform output power supply (FASREC-PW)

Special waveforms can be output arbitrarily. By inputting a signal of a desired voltage or current waveform into the power supply, will result in a waveform that is equivalent to the input signal when outputted. DC, AC, AC-superposed DC and distorted waveforms can be outputted.

Features

- **Compact design**

The configuration resorting to IGBT allows for a compact size, yet retaining a large capacity.

- **Quick response**

The carrier is high frequency, with an output precisely corresponding to the setting signal.

- **High power factor**

The use of a diode rectifier at the input section provides input of a high power factor (95% or higher when the output is 100% of capacity).

Applications and specifications

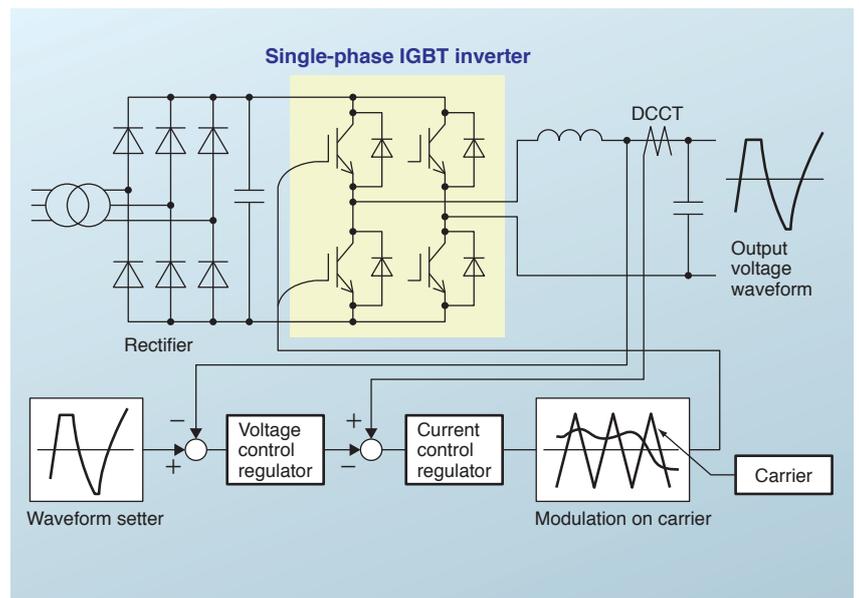
Application	Input	Output
Aluminum sash coloring	3 ϕ , 3.3kV, 6.6kV, 400/440V, 50/60Hz	$\pm 50V$, 100 to 10000A
Heating	3 ϕ , 3.3kV, 6.6kV, 440V, 50/60Hz	1 ϕ , 200 to 2000kW

Typical appearance



▲ Large-capacity arbitrary-waveform output power supply (FASREC-PW) for aluminum sash coloring
Input: 3 ϕ , 6.6kV, 60Hz
Output: $\pm 50V$, 4,500A

Typical circuit configuration



IGBT type large-capacity chopper system

A large-capacity chopper system is destined for chemical plants and used for burnt ash melting in the latter.

Features

- **High power factor**
The power factor is high over a wide range of operation.
- **Space saving**
Space is saved because there is no need for a power capacitor.
- **Operation continues even in the event of a momentary power drop.**
- **Quick response**
- **Small generation of harmonic current**
Multi-phase rectification reduces the harmonic current generation.

Applications and specifications

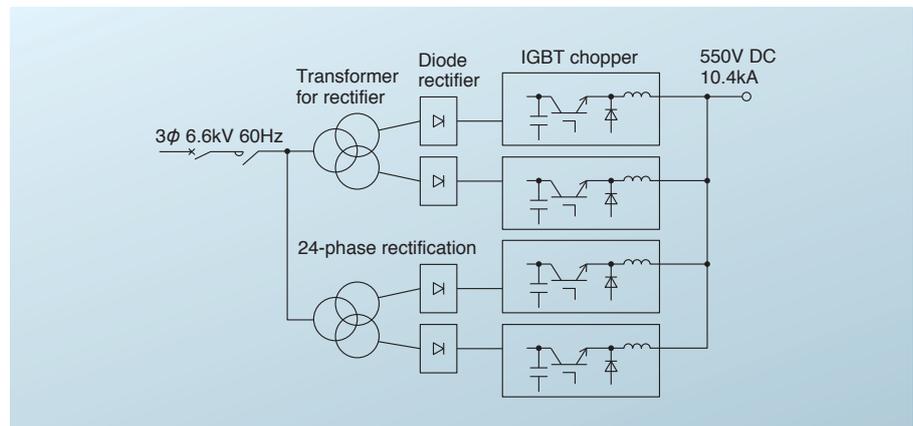
Application	Input	Output	Cooling
Chemical plant, burnt ash melting	3 ϕ , 6.6kV, 60Hz	550V DC, 10.4kA	Forced air

Typical appearance



▲ **Chopper for ash melting**
Input: 3 ϕ , 6.6kV, 60Hz
Output: 550V DC, 10,400A

Typical circuit configuration



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