

# High peak capacity power supply Best suited for motor or solenoid usages

## GPSA-600 series

It is sometimes used large capacity of power supplies only for covering the peak load current. By using our power supply with having a high peak capacity, downsizing and cost reduction are realized. We measured how one unit of GPSA-600-24P performs peak power with their motorized roller in cooperation with ITOH DENKI CO., LTD.



**Standby Power**  
at 100 VAC at 230 VAC  
**0.24W 0.35W**

\* Standby power is an example of actual measurement.

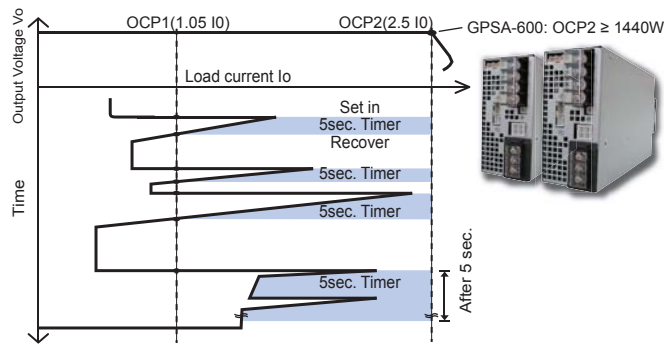
Continuous Max.: **600W**  
Peak: **960~1440W**

Approx. 2.4 times max. peak power than rated output is possible for large capacity load

Rated **600W** → Peak max. **at 100 VAC 1200W**  
**at 200 VAC 1440W**

### Feature 1 Two sets of overcurrent protection (OCP1, OCP2)

GPSA has two sets of over current protection of 5 sec. timer shutdown and hold down, best for induction motor load.



If the output current exceeds OCP2, the output voltage will come to hold-down area and when the voltage returns under OCP2, the output will recover.

If the output current exceeds OCP1, the 5 sec. timer will set in and then reset if the load current decrease less than OCP1 within 5 second. If not, the output power will shut off.

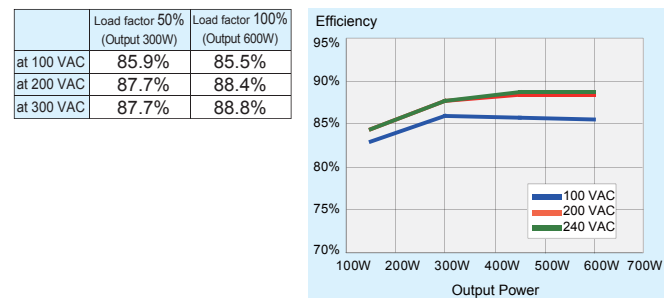
In order to reset the power supply after being shut off by 5 sec. timer, remove AC power for 10 second and turn on again. Any factor that causes overcurrent conditions more than 5 sec. must be fixed.

In case of a repetitive pulse load within OCP2 point, the actual output current calculated by root-mean-square value shall be less than 100% of the rated current.

The GPSA series, however, has a safety design feature such as internal over heat protection that prevents its damage from a miss use due to over powered pulse loads.

### Feature 2 High efficiency

At rated output and 240 VAC input, 88.8% high efficiency is achieved. Energy-saving and the reduction of CO<sub>2</sub> emission can be contributed at this age.



### Feature 3 +12V standby output

It can output +12VSB/0.5A as auxiliary power (standby output). For example, we have track record such as 24V for motor drive and 12VSB as power supply used for interface of LAN and USB for finance terminal equipments. Also, it can be used as standby power for remote ON/OFF function.

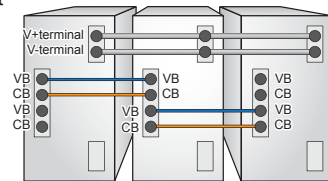
12V standby output  
+12VSB(Auxiliary power supply)  
**0.5A**

\* 0.3A max at backup operation

### Feature 4 3 units in parallel operation

In case of power shortage, output power can be increased with units in parallel connection. output voltage and current of each unit come to be balanced to deliver stable power by connecting output voltage balancing signal (VB) and output current balancing signal (CB).

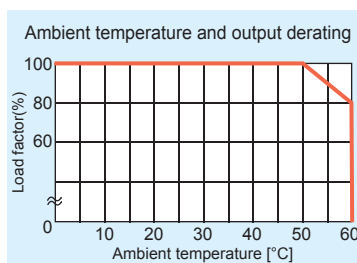
Output current at parallel operation must be "rated current times CHs connected times 90% of each output CH" or less.



(Referential picture)

### Feature 5 100% load factor with ambient temperature of 50 °C

As this unit works at ambient temperature of 50 °C with 100% load factor, high power feeding is available even at high temperature environment.



### Feature 6 Have resistance to dust or salt damage

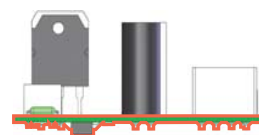
As with GPSA-360/750, Both side dip-coating available. Protection of discrete components such as diodes against dusts by tubing have been implemented.

Here's the solution! By whole-dip coating, as even double brushing cannot cover all area. It has brought continuous stable operation even under harsh neutral salt spray test! (Brush-coating proved poor operation to stop in several minutes.)



Under harsh neutral salt spray test (GPSA-750)

Both side dip-coating



### Feature 7 Backup operation during blackout

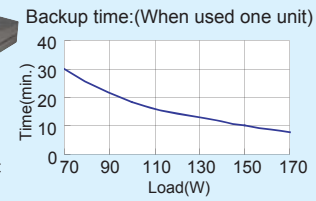
Achieving no power-off, no power-interruption environment, and switching without instantaneous stop

All GPSA series are equipped with blackout detection signal. The cost to produce detection unit can be reduced. Also, battery backup operation during blackout is possible for 12V or 24V output type with a battery package connected.

#### Battery package

Model : BS14\*-H24/2.5L  
Battery : Ni-MH battery  
Output : 24V 170W  
(Peak 240W 10s max.)

Backup time: See the graph on the right  
\* Backup time is just a guideline at first use, not guaranteed.



#### Products line-up

Model name	Output Voltage
GPSA-600-12P-TP	+12V
GPSA-600-24P-TP	+24V
GPSA-600-36P-TP	+36V
GPSA-600-48P-TP	+48V

#### GPSD38-700-54

Large input range from 200 VDC to 500 VDC

\*Contact us for the detail specification

#### Output specification

Output Voltage	+12V	+24V	+36V	+48V	+12VSB(common spec)
Max. current/power (continuous)	50A 600W	25A 600W	16.6A 600W	12.5A 600W	0.5A(0.3A) 6W(3.6W)
Peak current/power (5s) 100 VAC	80A 960W	50A 1200W	33.3A 1200W	25A 1200W	0.5A(0.3A) 6W(3.6W)
Peak current/power (5s) 200 VAC	100A 1200W	60A 1440W	40A 1440W	30A 1440W	0.5A(0.3A) 6W(3.6W)
Min. current	0A	0A	0A	0A	0A

\*Refer to () for the backup operation

## ITOH DENKI CO., LTD. DC motorized roller

### Contributes to an energy-saving conveying, DC motorized roller "POWER MOLLER 24"

**MDR**  
Motor-Driven Roller

**POWER MOLLER<sup>®</sup> 24**

The dedicated driver for MDR



MDR: POWER MOLLER 24

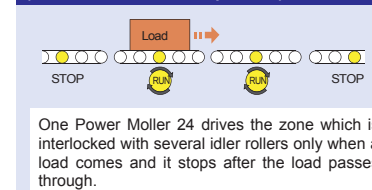
MDR stands for Motor Driven Roller that is a generic term for the motorized roller of conveyer with DC brushless motor. ITOH DENKI CO., LTD. is working on the global distribution of MDR as the leading manufacturer of motorized roller (the trade name: Power Moller 24).

### Applied MDR to the features of conveyer

#### 1 | Contributes to energy saving

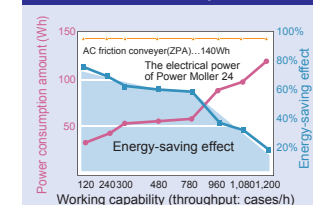
MDR applied conveyer achieves approx. 60% energy saving compared with an external motor driven method by "Run on demand motor operation" (Figure 1) which makes necessary parts drove for conveying goods (Figure 2). Also, the energy conversion efficiency from electric to rotational is high; approx. 70-80% by DC brushless motor (in the case of AC motor, approx. 50%) and if it is the same size, the motor power is 5 times higher. In addition, no pneumatic conveyer gives more energy-saving.

Drive only the necessary zones to convey (Run on demand motor operation)



(Figure 1)

Power comparison with AC friction conveyer



(Figure 2)

#### 2 | Safety-conscious

- The power supply 24V DC with low voltage is not in danger of having the electric shock so it is easy to handle.
- The torque can be stopped by hand to avoid the risk of injuries
- The connection is "plug and play" to run immediately. An installation work can be shorten and no need of technician.

### Feature 8 Modification feasibility

Flexible modification as customer's requirements

Nipron can modify the products flexibly as customer's requirements. Please contact us if you have any required specifications.

#### Modification examples

- Both side dip-coating
- Output voltage change
- 20 °C operation
- DC input
- Constant current
- SEMI F47 standard compliant

#### 3 | Creates a comfortable environment

- The external motor and rolling shaft of previous model are not needed. Therefore the bottom side of conveyer has flat and slim structure and simple line so that low-floor line is achieved.
- As for the sound noise, MDR's low sound noise structure, Run on demand motor operation (without continuous operation) and no pneumatic architecture give a comfortable environment.

#### 4 | Highly advanced control

- Highly intelligent control/conveyer systems such as dividing, combining and traceability control etc. are achieved.
- "id Linx" controller gives the autonomous decentralized computer network control which is integrated with information technology.

#### 5 | Reduce total cost

- Initial cost => Plug & Play and simple structure cut the construction cost. Also an easy layout design reduces processes.
  - Running cost => Not only energy-saving, layout modification or additional construction is easy. It gives low running cost.
  - Maintenance cost => The number of components is small. Installation and the replacement of failure units are easy and the adjustment is not needed so that the downtime is shortened.
- \* The staff cost for maintenance is reduced. The total initial cost and running is drastically saved.

# The actual measurement of peak current in the case of simultaneous start of all zones

We measured how many zones of the motorized roller "POWER MOLLER 24" can be started by using one unit of GPSA-600-24P in cooperation with ITOH DENKI CO., LTD.

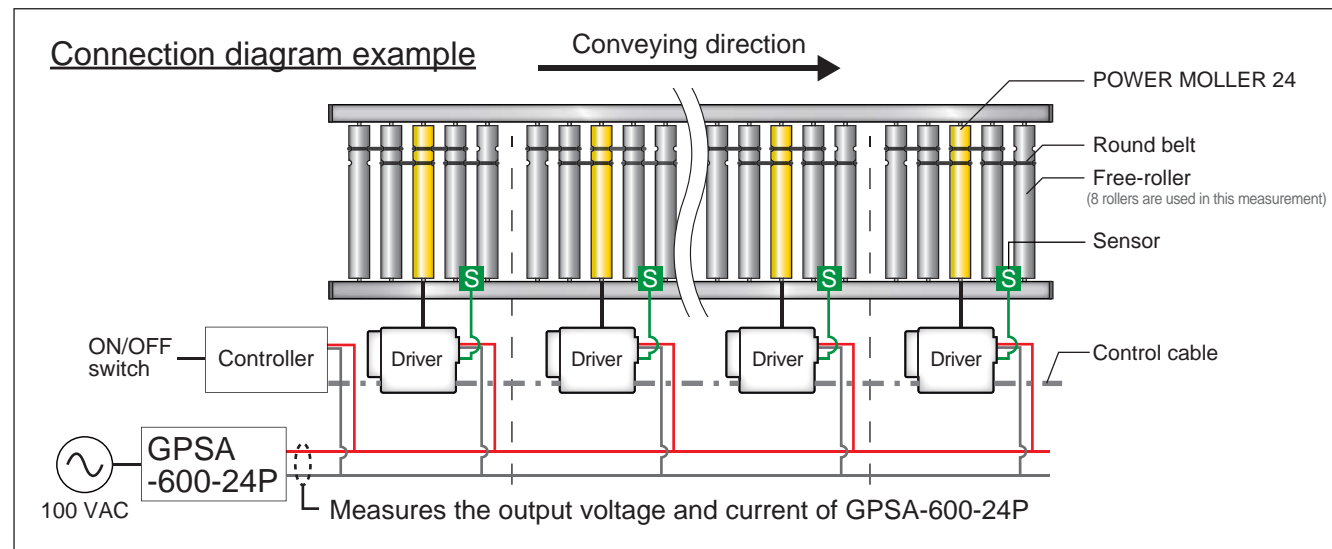
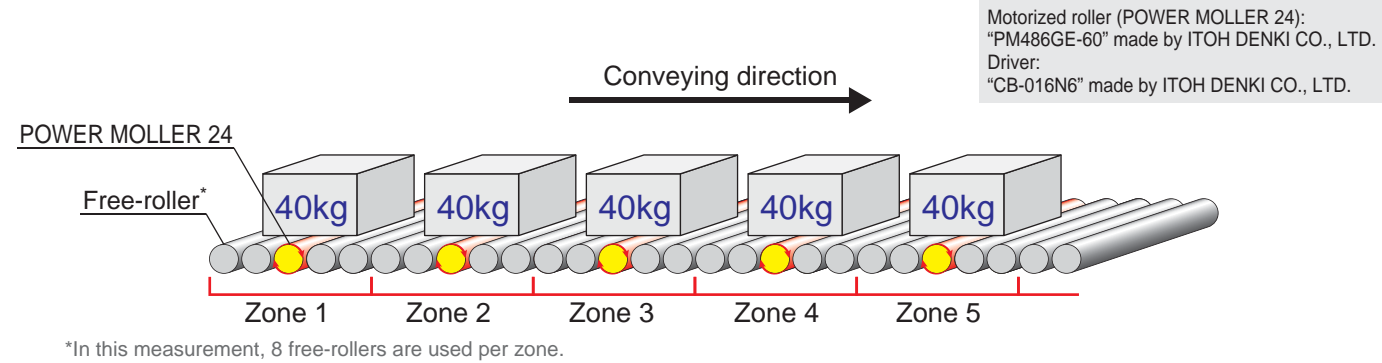
## Measurement condition

Conveying method: Simultaneous start (0.3sec slow-start configuration)  
 Conveying speed and weight: 60m/min. / 40kg (put on each zone)  
 Connected zones number\*: 1, 4, 8, and 12 zones

\*Zone: The part where one POWER MOLLER 24 is interlocked with several free-rollers (8 rollers in this measurement)

Simultaneous start: After the confirmation of conveying of downstream zone, then, self-zone starts conveying.  
 Slow-start configuration: By setting the time from the starting of POWER MOLLER 24 until achieving the settle speed, slow-start configuration prevents cargo collapsing.

Measurement: The peak current voltage value of GPSA-600-24P is measured with each 1, 4, 8, and 12 zone started simultaneously.

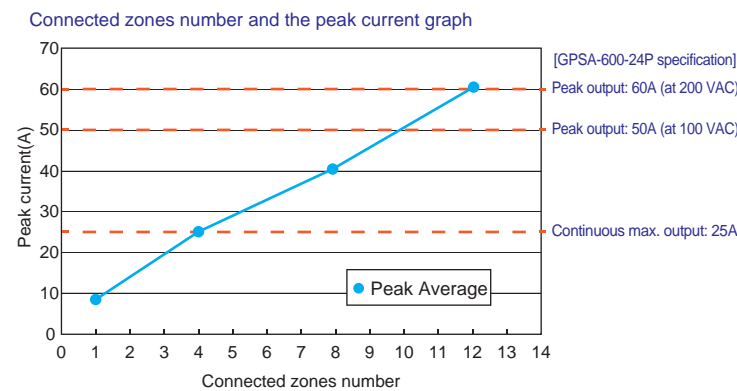


## Measurement result

### Measurement at 1, 4, 8, and 12 zones

The peak current voltage value with each 1, 4, 8, and 12 zone started simultaneously.

Input voltage: 100 VAC	Number of measurements	Connected zones number			
		1 zone	4 zones	8 zones	12 zones
GPSA-600-24P output current peak value (A)	1	8.4A	24.5A	42.2A	60.2A
	2	8.3A	23.9A	40.2A	61.7A
	3	8.6A	26.2A	40.5A	59.6A
	4	8.4A	25.6A	39.8A	59.7A
	5	8.4A	24.8A	41.0A	60.3A
	6	8.5A	25.5A	39.9A	60.9A
	7	8.2A	24.5A	40.5A	60.1A
	8	8.1A	24.1A	40.4A	61.2A
	9	8.4A	24.0A	39.8A	60.3A
	10	8.3A	25.7A	41.1A	61.4A
	Average	8.4A	24.9A	40.5A	60.5A



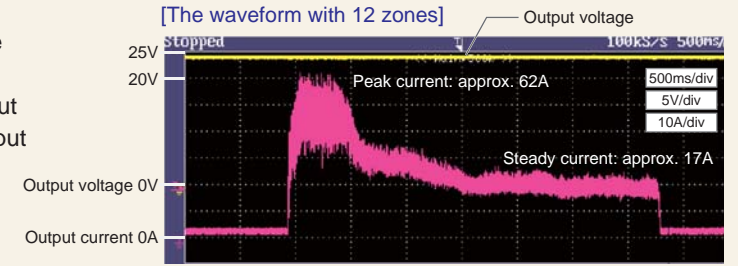
## [The result with 1 - 8 zones]

As a result of left measurement column, the peak current of GPSA-600-24P is within the specification at 1-8 zones simultaneous start. Also, the steady current after starting is approx. 1.4A per zone (approx. 11.2A at 8 zones) and it should work without any problems.

## [The result with 12 zones]

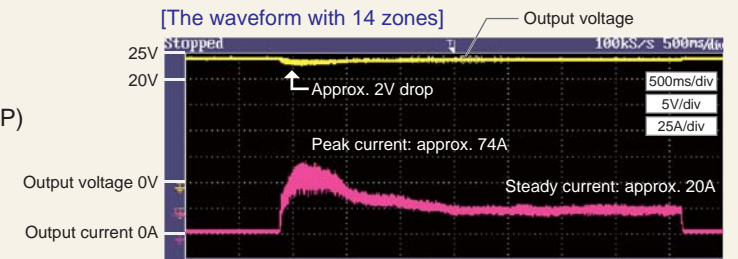
The measurement result with 12 zones is 60.5A average peak value. Although it is over the specification of GPSA-600-24P, but POWER MOLLER 24 worked without any problems. In addition, in the right waveform, the output voltage of GPSA-600-24P does not drop and the steady current is approx. 17A. Therefore it should work without any problems.

\*Regarding the specification, we can also make a supplemental specification. Please contact us for detail.



## [The result with 14 zones]

We also tested with 14 zones. The right waveform is measurement value. Although POWER MOLLER 24 worked, the peak value was 74A and it is over the specification. Also, it is in the overcurrent protection (OCP) area and approx. 2V drop was confirmed. The recovery from the OCP of GPSA-600-24P is automatically recovered and power supply did not stop. Therefore POWER MOLLER 24 started but another test would be required to confirm how much voltage drop is accepted for POWER MOLLER 24.



## Conclusion

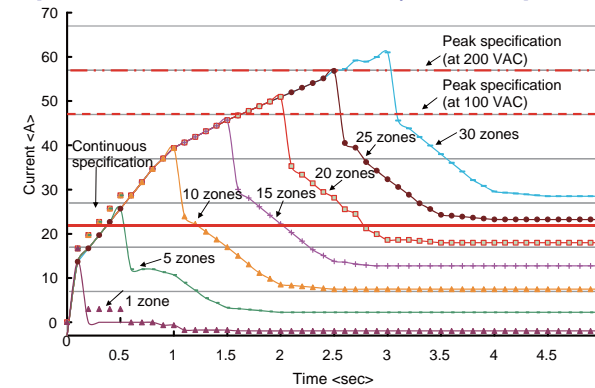
In this simultaneous start of POWER MOLLER 24 (0.3 sec slow start configuration), we confirmed up to 14 zones test and POWER MOLLER 24 started at all the tests. Therefore it can be judged that GPSA-600-24P has a capability with driving up to 14 zones. However, with 14 zones, it was in the overcurrent protection (OCP) area and the output voltage dropped a little. We would recommend to use up to 12 zones as the product specification.

## In order to increase the number of zones

There is a way to increase the number of zones by one GPSA-600-24P. It is to delay each start of zones. By delaying each start of zones, peak current can be suppressed so that the number of zones can be increased. The following graphs are the waveform of current in the case of delaying each zone by 0.1 sec and the relation of the number of connected zones and current. Since the peak current is suppressed than simultaneous start, it can be used up to 16 zones (at 100 VAC input) or 23 zones (at 200 VAC input). In addition, the steady current at 100 VAC input has a margin from the specification. Therefore there is possibility to increase the number of zones by confirming the voltage drop at peak output.

### In the case of delaying each zone by 0.1 sec

#### [The relation of the time at 0.1sec delay and current]



#### [The relation of the number of connected zones and current]

