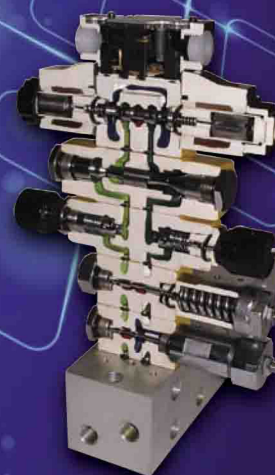
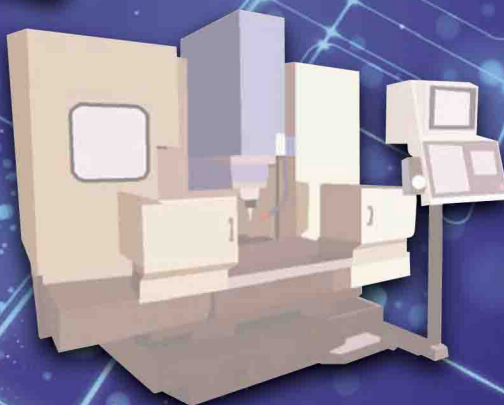


# Hydraulic Equipment for Machine Tools



# Energy Saving Devices

## Energy-saving Hydraulic Units & Controllers

Achieving significant energy savings by controlling the induction motor speed!

### Energy-Saving Control System for Hydraulic Units (Energy-saving Controller)

- **Greatly reducing power consumption**

Power consumption during operation at full cut-off pressure is reduced by up to 70%.

- **Low noise and Low heat generation**

By decreasing the motor speed at full cut-off pressure, the noise level and the fluid temperature increase are reduced by 20 dB (A) or more and 20 °C or more, respectively (compared to our standard hydraulic power unit YA Pack).

- **Combined with an existing hydraulic unit to offer an energy-saving solution!**

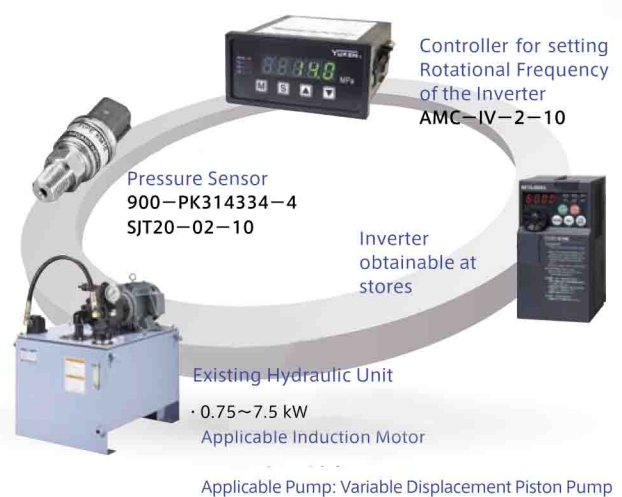
Combined with an existing hydraulic unit, the energy-saving control system can offer an energy-saving solution at low cost.

- **Easiness to use**

Also available with an automatic tuning function that requires no initial setup.

Energy-saving effect can be obtained by adding the controller, the pressure sensor, and the inverter to an existing unit and carrying out simple adjustments.

#### System Configuration



### Energy-Saving Hydraulic Unit YA-e Pack

**Maximum 70% reduction in power consumption**  
(compared with our conventional products)

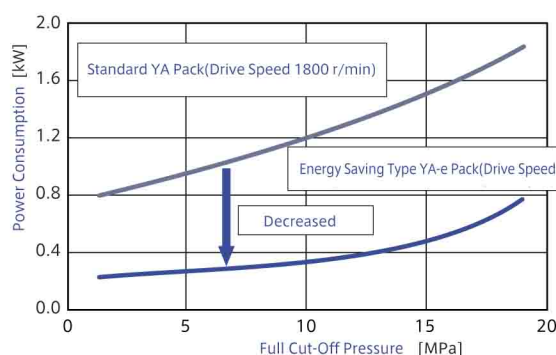
Energy-saving units equipped with the high efficiency, high performance A/AR series variable displacement pumps. Substantial energy saving of hydraulic units has been achieved by the inverter drive.

#### Specifications

- Geometric Displacement:  
10/15.8/22.2/36.9 cm<sup>3</sup>/rev
- Electric Motor:  
1.5~7.5 kW × 4P
- Reservoir Capacity:  
20~160 L
- Max. Operating Pressure:  
7/16 MPa

Representative Example of  
Power Consumption

Comparison to Standard  
Products at Full Cut-off  
(3.7 kW-Product)



## Standard Hydraulic Power Units & Packages

These hydraulic power units achieve energy-saving operation with a high efficiency piston pump

### YA Series L Pack

- Compact and Lightweight
- Low Noise

#### ■ Specifications

- Geometric Displacement: 8.5/16.3 cm<sup>3</sup>/rev
- Max. Operating Pressure: 3.5/7.0 MPa
- Reservoir Capacity: 10/19 L
- Electric Motor: 0.75~2.2 kW AC200V 3 φ

*Smart & Compact*

**YA-Light**



### YA Pack

#### ● Wide assortment of models

A total of 31 models are available according to the combination of the built-in pump, the reservoir capacity, and the motor output, so that the most suitable model can be selected.

#### ● Facilitating the configuration of the control circuit

With 21 different options (incorporating a base plate, etc.), a wide variety of control circuits can be easily configured.

#### ■ Specifications

- Geometric Displacement: 10.0~36.9 cm<sup>3</sup>/rev
- Max. Operating Pressure: 7/16 MPa
- Reservoir Capacity: 20~160 L
- Electric Motor: 0.75~7.5 kW AC200V 3 φ



### YF Pack

- Compact and Lightweight
- Low Noise

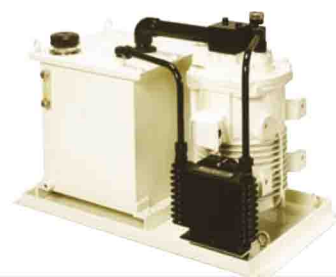


#### ■ Specifications

- Geometric Displacement: 10.0/15.8 cm<sup>3</sup>/rev
- Max. Operating Pressure: 16 MPa
- Reservoir Capacity: 10/20 L
- Electric Motor: 0.75~2.2 kW AC200V 3 φ

### YP Pack

- Compact
- Low Noise



#### ■ Specifications

- Geometric Displacement: 10.0~36.9 cm<sup>3</sup>/rev
- Max. Operating Pressure: 7/16 MPa
- Reservoir Capacity: 10~30 L
- Electric Motor: 0.75~5.5 kW AC200V 3 φ



# Global Standard Devices

## Solenoid Operated Directional Valves

A wide assortment of products, including those for overseas markets, allows you to choose the best solution for your needs.

### Solenoid Operated Directional Valves 005/007 Series

- **Compact and Lightweight**

- For the DSG-007 series, the mounting surface conforms to ISO 4401-02-01-0-94.

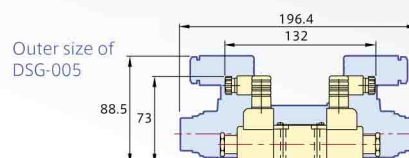
#### ■ Specifications

- Max. Flow: 15 L/min
- Max. Operating Pressure: 25 MPa

Flying Lead  
Wire Type



Plug-in  
Connector Type



**Volume 60% reduced** (Compared to DSG-001)

### Solenoid Operated Directional Valves 1/8 Series

- **High Pressure & High Flow Rate**

- **Usable in products of various standards**

These standard valves are CE certified for installation in equipment overseas. UL/CSA certified products are also available.

- **Two low-wattage models, the 5 W type and 14 W type**

- **M12-4 pin connector**

M12-4 pin connector suited for serial transmission and connecting to DeviceNet, a wire-saving system. The M12-4 pin connector is easy to wire, thus shortening wiring time and preventing faulty wiring.

Terminal  
Box Type



Plug-in  
Connector Type



- **A center plug-in connector.**

To saving wiring, a center plug-in connector on the terminal box is available. When using double solenoid type valves with typical plug-in connectors, wiring to both plug-in connectors is required. However, by using a single centre din connect or wiring time is reduced.

#### ■ Specifications

Valve Type	Model Numbers	Max. Flow L/min	Max. Operating Press. MPa
Standard Type	DSG-01	100	35
Shockless Type	S-DSG-01	63	25
Low-wattage Type(14W)	L-DSG-01	40	16
Low-wattage Type(5W)	E-DSG-01	45	16

## 005/007/01 Series Modular Valves

These stackable valves facilitate construction of control circuits.

- **Space saving**

The valves are stacked vertically, providing significant space savings.

- **Easy circuit construction**

A circuit can be easily constructed by stacking the modular valves and fastening them with stud bolts.

- **Improved reliability**

Since no piping is required between the modular valves, piping-related problems, such as fluid leakage, vibration, and noise, are minimized.

005 Series  
Modular Valves



01 Series  
Modular Valves



#### ■ Specifications

Valve Type	Max. Flow L/min	Max. Operating Press. MPa
005/007 Series	15	25
01 Series	35 (60)	31.5

# High Performance Devices/Global Standard Devices

## High-Speed Linear Servo Valves/On-Board Electronic Type Linear Servo Valves

Thanks to their excellent repeatability, these valves are best suited for machines for precision machining.

### ●High accuracy

These valves have a low hysteresis of 0.1% or less, achieving high accuracy. They allow the main unit to operate with much higher repeatability.

### ●High response characteristics

The valves provide significantly high levels of step and frequency responses; the step response is 2 ms, and the frequency response is 450 Hz(for LSVG-03). Thus, the valves ensure that the main unit can achieve unprecedented high response.

### ●Excellent contamination resistance

The valves can handle hydraulic fluid having a contamination level of up to NAS class 10, significantly reducing fluid maintenance costs.

### ●Improved user-friendliness

The OBE type linear servo valves integrate a dedicated amplifier for maximum user-friendliness and facilitate construction of hydraulic control systems.

High-speed Linear Servo Valve



Direct Type  
LSVG-03



Two Stage Type  
LSVHG-06

On-Board Electronics Type Linear Servo Valves



Direct Type  
LSVG-01EH/03EH



Two Stage Type  
LSVHG-03EH/04EH/06EH

### ■ Specifications

#### ● High-speed Linear Servo Valve

Valve Type		Direct Type	Two Stage Type
Rated Flow(@7MPa)	L/min	4~60	750~3800
Max.Operating Pressure	MPa	35	31.5/35
Step Response 0→100%V	ms	2/3	8~15
Frequency Response (±25% Amplitude/-90 degree)	Hz	410/450	85~110

#### ● On-Board Electronics Type Linear Servo Valves

Valve Type		Direct Type	Two Stage Type
Rated Flow(@7MPa)	L/min	4~60	210~1300
Max.Operating Pressure	MPa	35	31~35
Step Response 0→100%V	ms	3~4	7~15
Frequency Response (±25% Amplitude/-90 degree)	Hz	260~310	70~110

## Piston Pumps

These pumps minimize the output flow during pressure holding for energy-saving purposes.

### Piston Pumps ARL1 Series

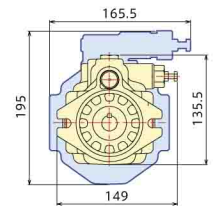
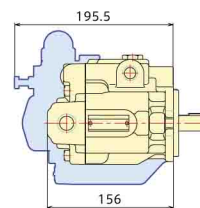
- Compact and Lightweight
- Low Noise



#### ■ Specifications

- Geometric Displacement: 6.2~16.3 cm<sup>3</sup>/rev
- Max. Operating Pressure: 7 MPa
- Shaft Speed Range: 600~1800 r/min

Outer size of ARL1



**Volume 50% reduced** (Compared to AR16)

### Variable Displacement Piston Pumps AR Series

- Compact
- Low Noise



#### ■ Specifications

- Geometric Displacement: 15.8/22.2 cm<sup>3</sup>/rev
- Max. Operating Pressure: 16 MPa
- Shaft Speed Range: 600~1800 r/min

### Variable Displacement Piston Pumps A Series

- high efficiency
- A variety of control type
- Low Noise



#### ■ Specifications

- Geometric Displacement: 10~219 cm<sup>3</sup>/rev
- Max. Operating Pressure:  
Rated: 16, 21, 25 MPa Intermittent: 16, 21, 28 MPa
- Shaft Speed Range:  
A10~A145: 600~1800 r/min A220: 600~1500 r/min

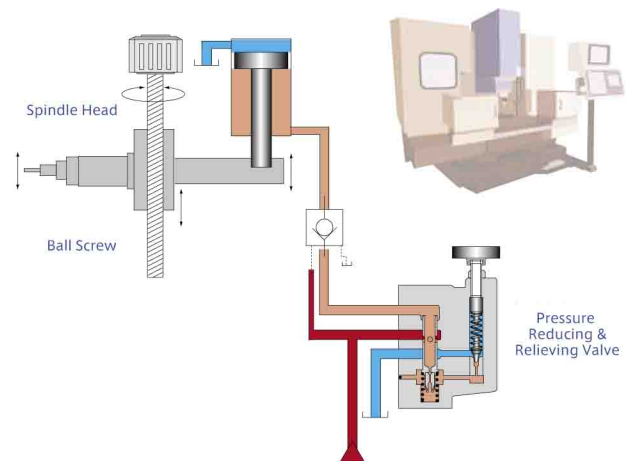
# Hydraulic Circuit Applications for Machine Tools

We offer a wide assortment of products that support a complete range of hydraulic circuit applications.

## Applied Circuit Example 1 Balancing Circuit

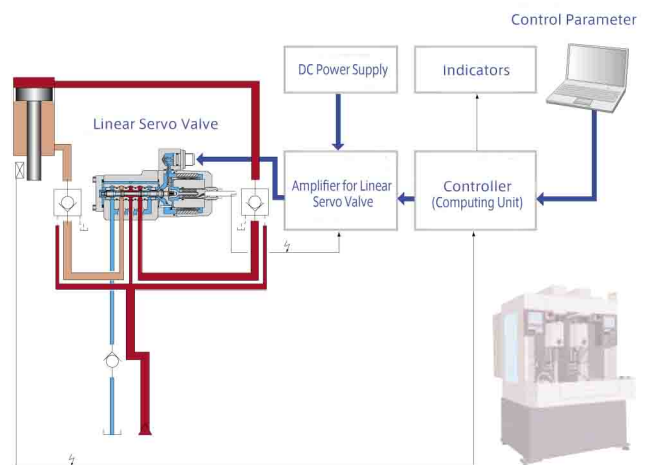
A balancing circuit, which was formerly composed of a reducing valve and relief valve (counterbalancing function), can now be replaced by one balancing valve alone. New balancing circuit not only provides ease of balance pressure adjustment, but also permits substantial circuit simplification.

Even when the load is increased or decreased, the balance pressure setting can be readjusted simply by operating the pressure adjustment handle.



## Applied Circuit Example 2 Honing Circuit

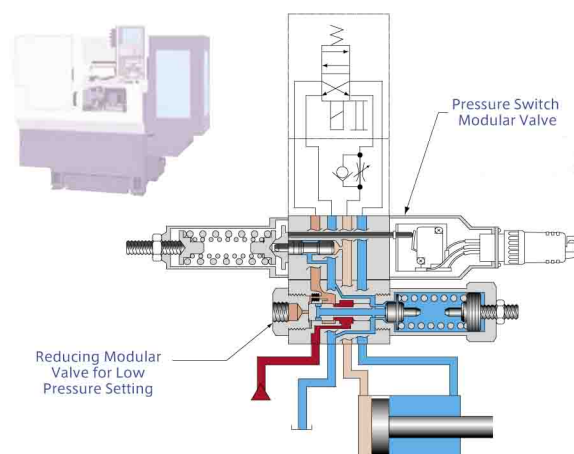
The linear servo valve provides excellent repeatability and improves the accuracy of machined surface roughness. Since the valve can handle hydraulic fluid having a contamination level of up to NAS class 10, it facilitates simple fluid maintenance compared to conventional servo valves.



## Applied Circuit Example 3 Chucking Circuit

The low-pressure setting reducing modular valve is effective in minimizing work chuck distortion. The pressure switch modular valve detects a pressure signal for chuck checkout purposes.

The use of the modular type pressure switch and low-pressure setting reducing valve results in substantial reduction of installation space and piping.



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Hydraulic Equipment  
for Machine Tools

Oct. 1980 First Edition  
Oct. 2012 Revised Edition 4