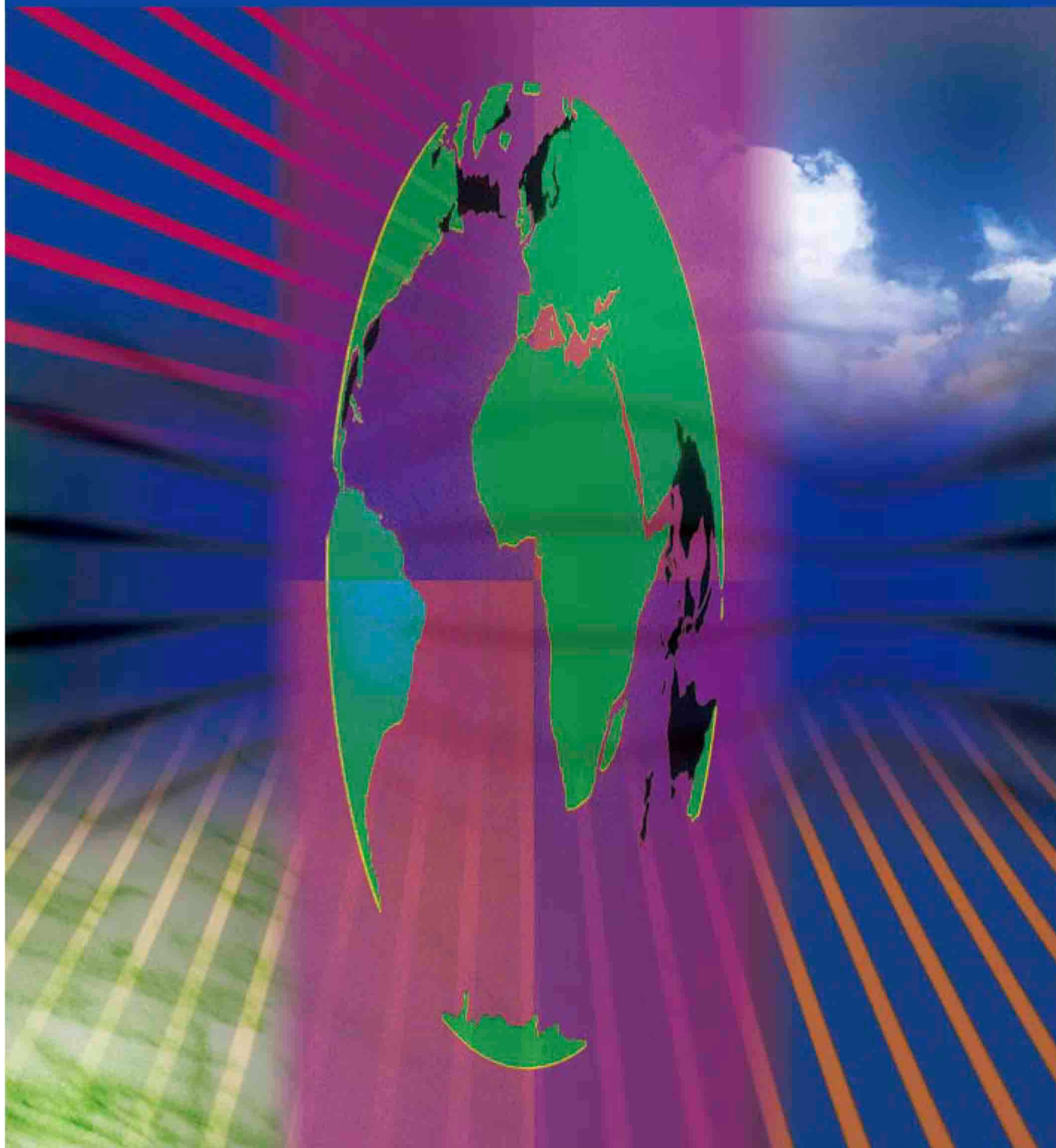


Hydraulic Equipment



YUKEN KOGYO CO., LTD.

YUKEN PRODUCTS FOR EVERY NEED

As a specialized manufacturer of hydraulic equipment, Yuken is trying hard to meet our customers' various requirements with a continuous effort to develop new products and improve the existing products.

This catalogue is compiled to introduce the line-up of Yuken's products.

It does not represent detailed technical information such as dimensions, specifications and characteristics of each and every product Yuken manufactures. If you require such information, please contact us or ask our sales representative for the "Engineering Information Catalogue" or "Product Catalogue" which are prepared separately.



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Piston Pumps

ARL1 Series Variable Displacement Piston Pumps

The ARL1 series piston pumps are compact, low noise, and high efficiency pressure compensator type piston pumps based on the proven technology and reliability of Yuken's "A series/AR series" piston pumps. These pumps cover the small displacement range from 6.2 to 16.3 cm³ /rev.



AR Series Variable Displacement Piston Pumps

These AR series pumps have been developed on the basis of the same design concept as A series pumps which are renowned for high efficiency and low noise level.

Using an aluminum body, the size of the pump is more compact and the mass is considerably reduced. The noise level has also been reduced.



A Series Variable Displacement Piston Pumps

The A series variable displacement piston pumps are high efficiency swash plate type piston pumps developed using Yuken's unique technology to meet customers' needs for energy efficient and low noise solutions. These pumps support a wide variety of displacement sizes and control types and are widely used in various hydraulic systems.



A3H Series Variable Displacement Piston Pumps

These A3H Series variable displacement piston pump offer high pressure, high efficiency, high speed and low noise features. This pump series has been developed using Yuken's unique design concept and cumulative technologies.

They are suitable for use with construction machinery and various industrial machinery ranging from presses to injection moulding machines.



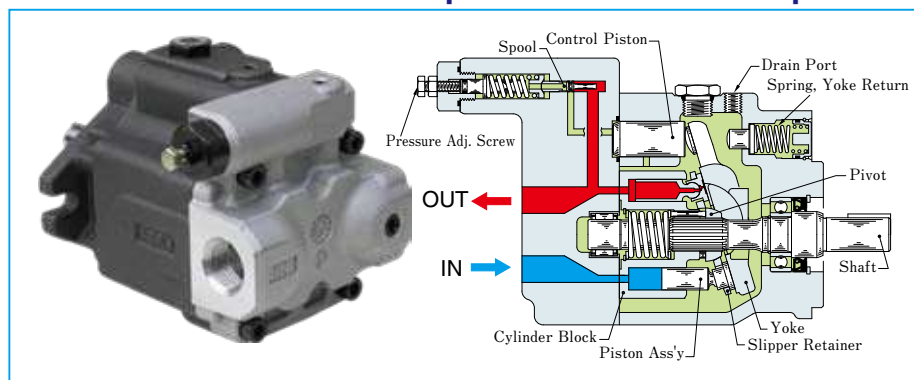
A7H Series Variable Displacement Piston Pumps

The A7H series variable displacement piston pumps offer a displacement of 180,270 cm³/rev with a rated pressure of 35 MPa and a maximum pressure of 40 MPa, supporting high pressure / high flow applications. The non-drive side of these pumps can be connected to an additional pump with SAE connection to provide a combined pump.



| Pump Type | | Maximum Operating Pressure MPa | Geometric Displacement cm ³ /rev | | | | | | | | | | | |
|---|---|--------------------------------|---|-----|--------|--------|---------|---------|--------|--------|--------|---------------------------|------|------|
| | | | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 300 | | | |
| A Series Variable Displacement Piston Pumps | "ARL1" Series Piston Pumps | 7 | | | ARL1-6 | ARL1-8 | ARL1-12 | ARL1-16 | | | | | | |
| | "AR" Series Variable Displacement Piston Pumps | 16 | | | AR16 | AR22 | | | | | | | | |
| | Single Pumps | 21 | | A10 | A16 | A22 | A37 | A45 | A56 | A70 | A90 | A100 | A145 | A220 |
| | | 16 | | | | | | | | | | | | |
| | | 21 | | | | | | | | | | | | |
| | | 28 | | | | | | | | | | | | |
| | Double Pumps | 28 | | | A16 | A22 | A37 | A56 | A70 | A90 | A145 | Inboard Pump (Driven End) | | |
| | Variable / Fixed Double Pumps | 28 | | | A16 | A22 | A37 | A56 | A70 | A90 | A145 | Inboard Pump (Driven End) | | |
| | | | | | A16 | A22 | A37 | A56 | A70 | A90 | A145 | | | |
| | "A3H" Series Variable Displacement Piston Pumps | 35 | | | A3H16 | A3H37 | A3H56 | A3H71 | A3H100 | A3H145 | A3H180 | | | |
| | "A7H" Series Variable Displacement Piston Pumps | 40 | | | | | | | | A7H180 | A7H265 | | | |

“ARL1” Series Variable Displacement Piston Pumps



Features

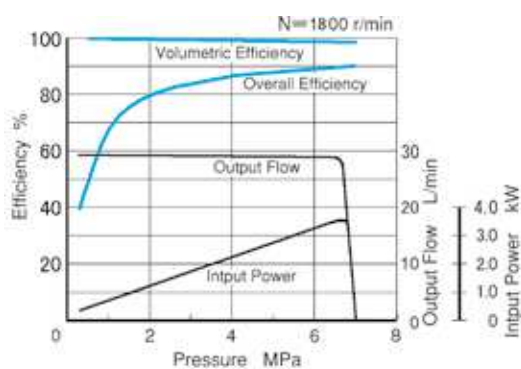
● Compact size

The “ARL1” series variable displacement piston pumps are designed to offer 40% reduction in weight and capacity and significantly smaller in size and lighter in mass compared with the “AR” series piston pumps.

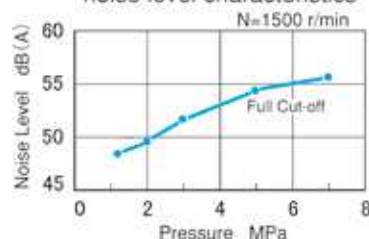
● Low noise level

The noise level of the ARL1 pump is as low as 55dB(A) [at 7MPa full cut-off pressure and 1500r/min] measured one metre horizontally away from the pump head cover.

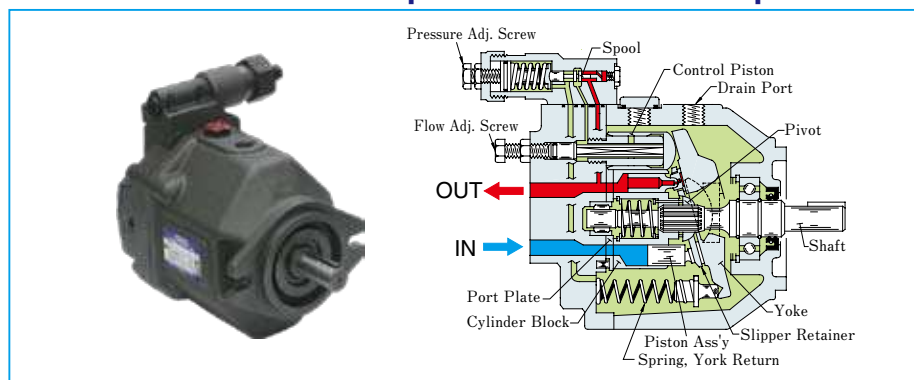
“ARL1-16” type performance characteristics



noise level characteristics



“AR” Series Variable Displacement Piston Pumps



Features

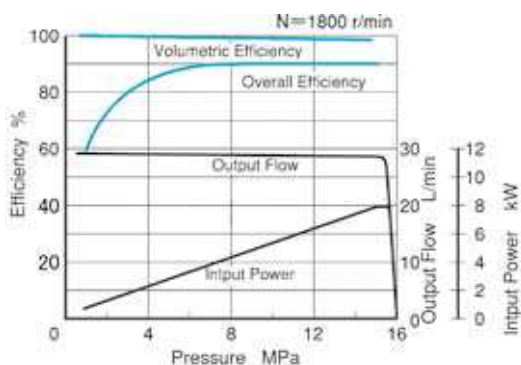
● High efficiency

At 16MPa loaded pressure and 1800 r/min rotating speed, volumetric efficiency is over 98% and overall efficiency is more than 90%.

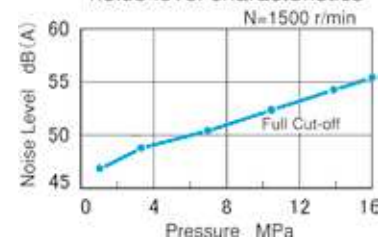
● Low noise level

The noise level of the ARL1 pump is as low as 55dB(A) [at 7MPa full cut-off pressure and 1500r/min] measured one metre horizontally away from the pump head cover.

“AR16” type performance characteristics



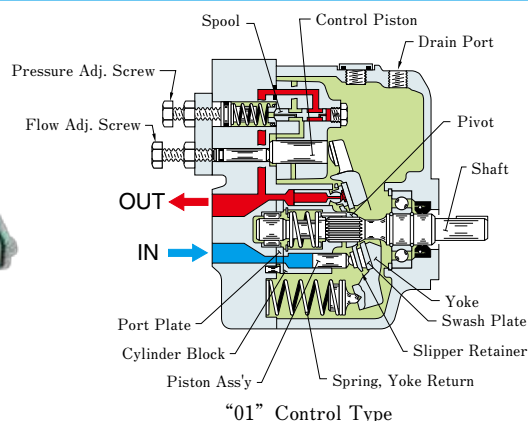
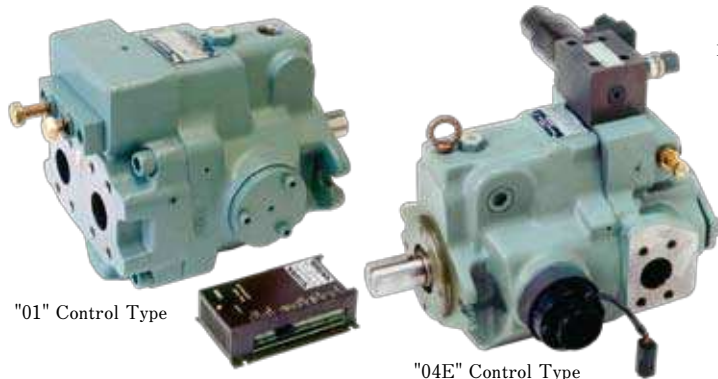
noise level characteristics



Control Type

| Control Type | Graphic Symbols |
|---|-----------------------------|
| “01” Pressure Compensator Type | |
| | Performance Characteristics |
| | |

"A" Series Variable Displacement Piston Pumps

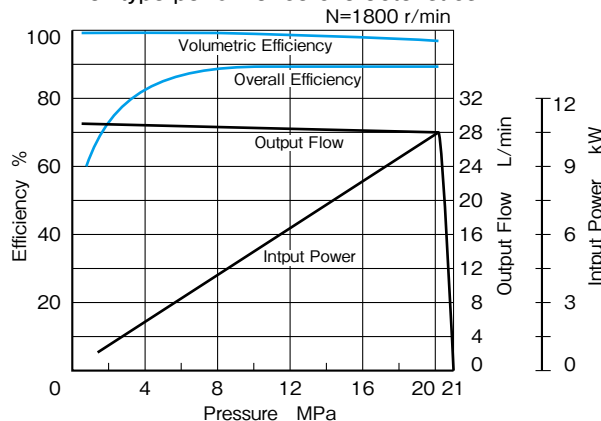


Features

● High efficiency

At 16MPa loaded pressure and 1800 r/min rotating speed, volumetric efficiency is over 98% and overall efficiency is more than 90%.

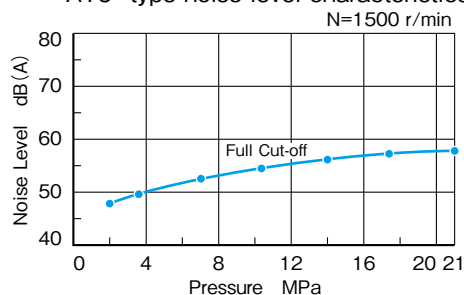
"A16" type performance characteristics



● Low noise level

The noise level of the A16 pump is as low as 57.3dB(A) [at 21MPa full cut-off pressure and 1500r/min] measured one metre horizontally away from the pump head cover.

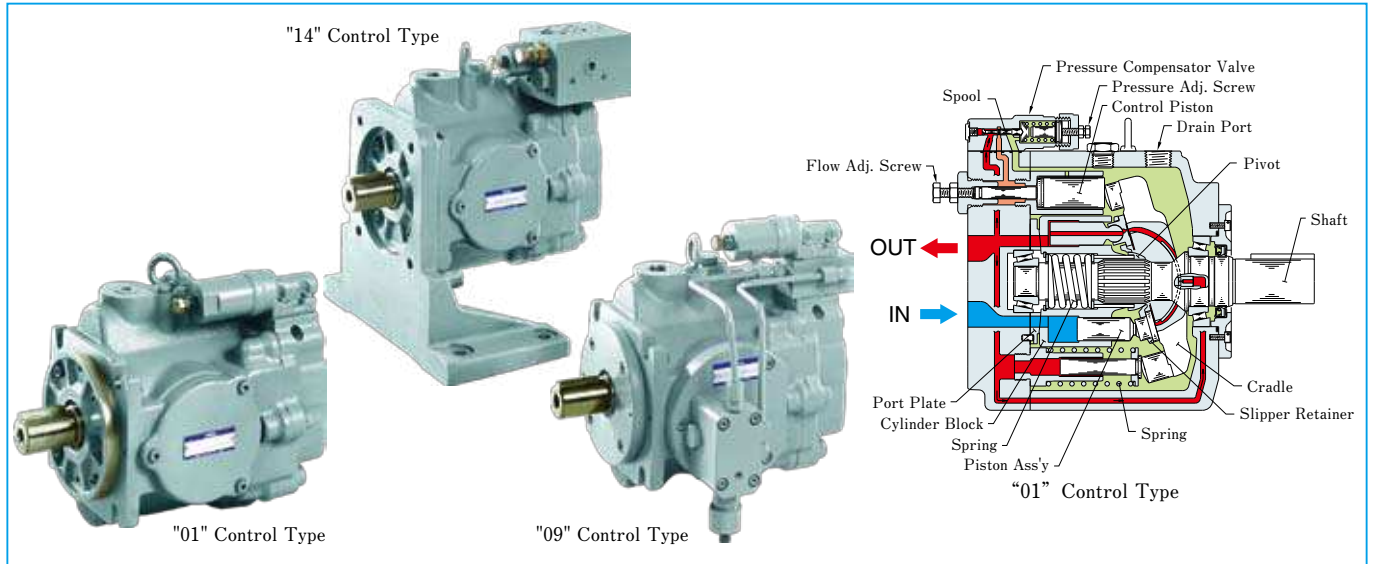
"A16" type noise level characteristics



Control Type

| Control Type | Graphic Symbols | Performance Characteristics | Control Type | Graphic Symbols | Performance Characteristics |
|---|-----------------|-----------------------------|--|-----------------|-----------------------------|
| "01" Pressure Compensator Type | | | "05" Two-Pressure Two - Flow Control Type by System Pres. | | |
| "02" Solenoid - two Pressure Control Type | | | "06" Two-Pressure Two - Flow Control Type with Solenoid Valve | | |
| "03" Pressure Compensator with Unloading Type | | | "07" Pilot Pressure Control Type Pressure Compensator | | |
| "04" Proportional Electro - Hydraulic Load Sensing Type | | | "09" Constant Power Control Type | | |
| "04E" Electro - Hydraulic Proportional Pressure & Flow Control Type | | | Simple Two-Pressure Two - Flow Control Type | | |
| "04EH" Electro - Hydraulic Proportional Pressure & Flow Control Type (OBE Type) | | | | | |

"A3H" Series Variable Displacement Piston Pumps

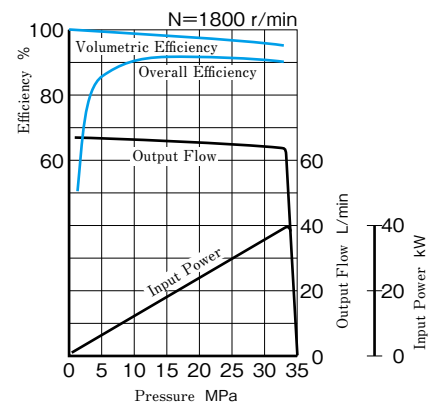


Control Type

| Control Type | Graphic Symbols | Performance Characteristics |
|---|-----------------|-----------------------------|
| "01" Pressure Compensator Type | | |
| "09" Constant Power (Torque) Control Type | | |
| "14" Load Sensing Type | | |
| "55" Simple Two-Pressure Two-Flow Control Type | | |

Features

- High performance at maximum pressure 35MPa
Volumetric efficiency is over 95% and overall efficiency is more than 90% at 1800 r/min.



- Compact size
A3H series are compact in size because output / mass ratio is large.

Specifications

| Model Numbers | Geometric Displacement cm ³ / rev | Minimum Adj. Flow cm ³ / rev | Operating Pres. MPa | | Shaft Speed Range r/min | | Mass kg (01 Control type) | |
|----------------------------|---|--|---------------------|--------------|-------------------------|------|-----------------------------|-----------|
| | | | Rated | Intermittent | Max. | Min. | Flange Mtg. | Foot Mtg. |
| A3H16-※R※KK ⁽¹⁾ | 16.3 | 8 | 28 | 35 | 3600 | 600 | 14.5 | 23.4 |
| A3H37-※R※KK | 37.1 | 16 | | | 2700 | 600 | 19.5 | 27.0 |
| A3H56-※R※KK | 56.3 | 35 | | | 2500 | 600 | 25.7 | 33.2 |
| A3H71-※R※KK | 70.7 | 45 | | | 2300 | 600 | 35.0 | 42.5 |
| A3H100-※R※KK | 100.5 | 63 | | | 2100 | 600 | 44.6 | 72.6 |
| A3H145-※R※KK | 145.2 | 95 | | | 1800 | 600 | 60.0 | 88.0 |
| A3H180-※R※KK | 180.7 | 125 | | | 1800 | 600 | 70.4 | 98.4 |

(1) The "A3H16" model does not support the "09" control type.

A through drive type to which a driven pump can be connected is also available. Contact us for details.

"A7H" Series Variable Displacement Piston Pumps



■ Features

● High Pressure–Large Volume Displacement

Adding to current A3H series, 180 + 270 cm³/rev displacement with rated pres. 35 MPa, Max. pres. 40 MPa pumps are now available.

● Optional Through Drive

Optional through drive allow an auxiliary or outboard pump (SAE Standard) to be directly mounted.

● Fire-Resistant Fluids

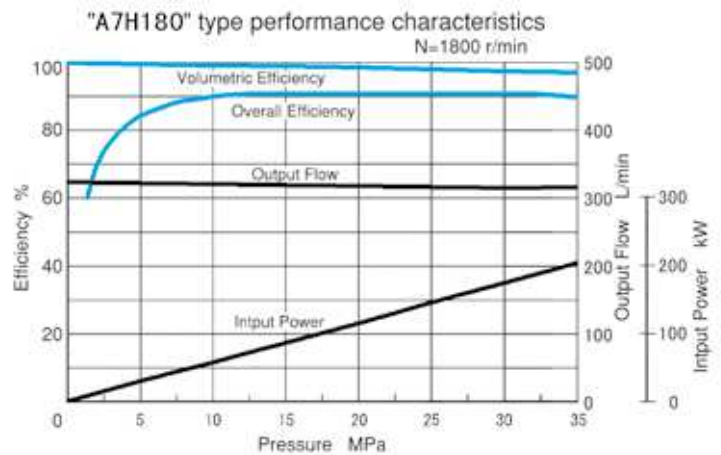
Water-Glycols and Polyol Ester Type are applicable under certain condition.

● High performance at maximum pressure 40 MPa

Volumetric efficiency is over 95% and overall efficiency more than 90% at 1800 r/min.

■ Control Type

| Control Type | Graphic Symbols | Performance Characteristics |
|--|-----------------|-----------------------------|
| "01" Pressure Compensator Type | | |
| "09" Constant Power Control Type | | |
| "09R" Constant Power Control Type with External Pilot | | |



■ Specifications

| Series Numbers | Geometric Displacement cm ³ /rev | Operating Pressure MPa | | Shaft Speed Range r/min | | Temperature Range °C | Viscosity Range mm ² /s | Approx Mass kg | |
|----------------|---|------------------------|--------------|-------------------------|------|----------------------|------------------------------------|----------------------|----------------------|
| | | Rated | Intermittent | Rated | Max. | | | Flange Mtg. | Foot Mtg. |
| A7H180 | 180 | 35 | 40 | 1800 | 1900 | -20 – +80 | 10–1000 | 150 "01" 154 "09" | 220 "01" 224 "09" |
| A7H265 | 270 | 35 | 40 | 1200 | 1600 | | | 220 "01" 224 "09" | 310 "01" 314 "09" |

■ Specifications for Special Fluids

| Type of Fluids | Series Number | Operating Pressure MPa | | Shaft Speed Range r/min | | Temperature Range °C | Viscosity Range mm ² /s |
|-------------------|---------------|------------------------|--------------|-------------------------|------|----------------------|------------------------------------|
| | | Rated | Intermittent | Rated | Max. | | |
| Water-Glycols | M-A7H180 | 21 | 25 | 1800 | 1800 | 10–50 | 20–1000 |
| | M-A7H265 | | | 1200 | 1200 | | |
| Polyol ester Type | P-A7H180 | 35 | 40 | 1800 | 1900 | 10–70 | 10–1000 |
| | P-A7H265 | | | 1200 | 1600 | | |

Friendly, Intelligent, Powerful

AC Servo Motor Driven Pumps

**Revolution
Control System**

ASR Series AC Servo Motor Driven Pumps

The ASR series provides variable flow by driving a piston pump directly with an AC servo motor and controlling the rotational speed in a range from zero to the maximum level. This series allows for precise control of flow / pressure by using a dedicated AMSR controller. It also offers excellent response and repeatability.



ASE Series AC Servo Motor Driven Pumps

The ASE series pumps inherit the basic concept of the shaft speed control from the ASR series pumps and offer high cost performance.

The pumps of this series offer easy shaft speed control for systems that do not require as much precision, response, or repeatability as the ASR series pumps offer.

With the output flow and the discharge pressure controlled by a dedicated AMSE controller, precision, response and repeatability of systems using the ASE series pumps have been improved compared with those using conventional variable displacement piston pumps.

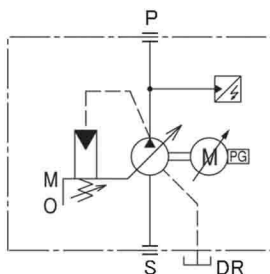


Specifications

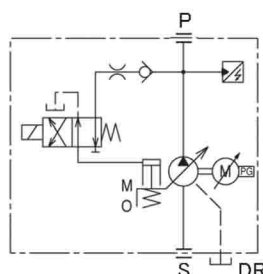
*) depends on pump displacement

| Model | ASR1-C | ASR2-C | ASR3-E, G | ASR5-G, J | ASR10-J, M | ASE3 | ASE5 | ASE10 | ASE15W |
|--------------------------|---|--------|-----------|-------------|------------|---|-------|--|------------|
| Max. Flow L/min | 39.5 | 55.5 | 92.3 | 129 | 200 | 80.8 | 132.7 | 205.4 | 302 |
| Max. Operating Pres. MPa | 21 | 16 | 21 | 21 | 21 | 17.5 | 17.5 | 17.5 | 17.5 (21*) |
| Min. Adj. Pres. MPa | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Motor Output kW | 4.5 | 4.5 | 6 to 8 | 8 to 11 | 11 to 15 | 11 | 20 | 35 | 35 |
| Mass (Pump + Motor) kg | 54 | 54 | 80 to 89 | 94 to 177.5 | 213 to 233 | 75 | 123 | 190 | 241.5 |
| Input Signal Voltage | 0 to +10V DC (Max.) | | | | | | | | |
| Monitor Output Voltage | 0 to +10V DC | | | | | | | | |
| Sequence I/O | Photo Coupler Input 8ch/Open Collector Output 6ch | | | | | Photo Coupler Input 8ch/Open Collector Output 5ch | | | |
| Power Supply | 3-Phase AC 200 to 230 V/3-Phase AC 380 to 480 V, 50/60 Hz | | | | | | | 3-Phase AC 380 to 480 V 50/60 Hz | |

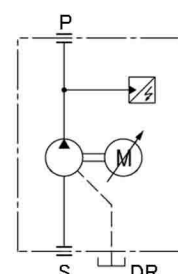
Graphic Symbols



ASR
Single Displacement Type



ASR
Dual Displacement Type



ASE

“ASR” Series AC Servo Motor Driven Pumps



Features

● High Performance

Special high power servo motor (SPM) and variable displacement piston pump → Improved ultralow speed molding & continuous pressure holding performance and excellent repeatability.

● High response

Ultra precise molding by high response injection with a high-efficiency piston pump.

● Energy saving

Power consumption less than half that of hydraulic machines and equivalent to that of full electric machines, with reduced standby power consumption

→ Dual displacement models allow more compact system designs.

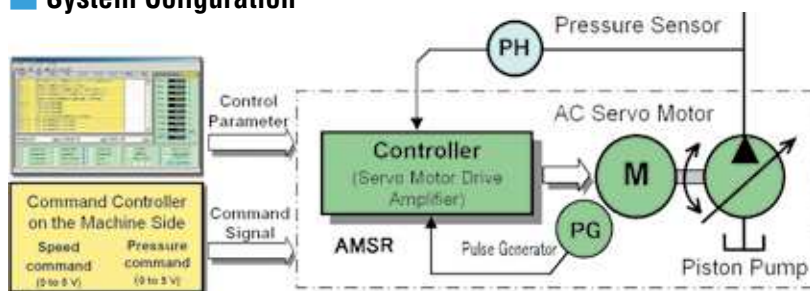
● Less wiring

Wire saving and miswiring prevention through the integration of the controller/driver and the use of special cables.

● Large flow

The AMSR controller has a combination function that supports operation with large flow up to 3200 L/min (ASR10 × 16 units).

System Configuration

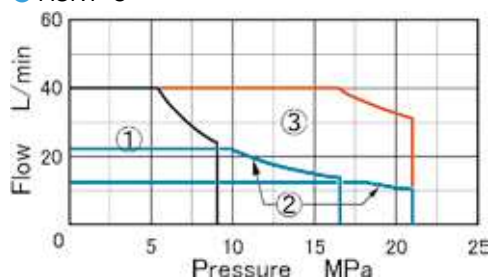


A feedback loop is by the AMSR controller that computes deviations between control signals from the machine side (speed and pressure commands) and sensor signals to drive the AC servo motor accordingly. Control parameters can be set digitally by using dedicated software.

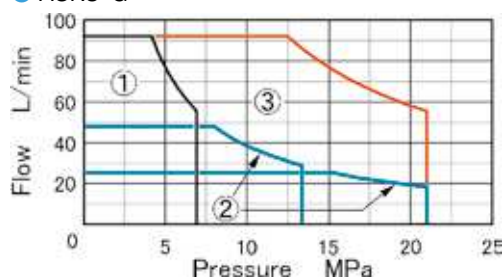
The AC servo motor is selected according to the torque and shaft speed required to drive the hydraulic pump. The selection of an appropriate motor for the load condition is important.

Sample of Pressure–Flow Diagram

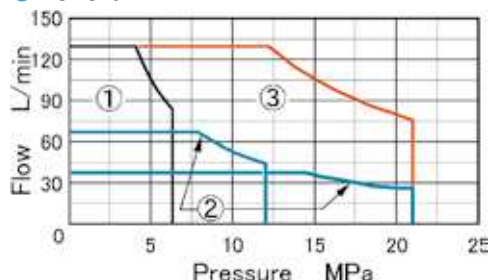
● ASR1–C



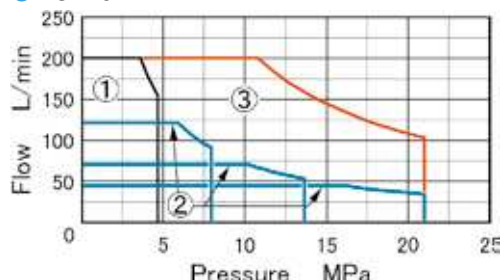
● ASR3–G



● ASR5–J



● ASR10–M

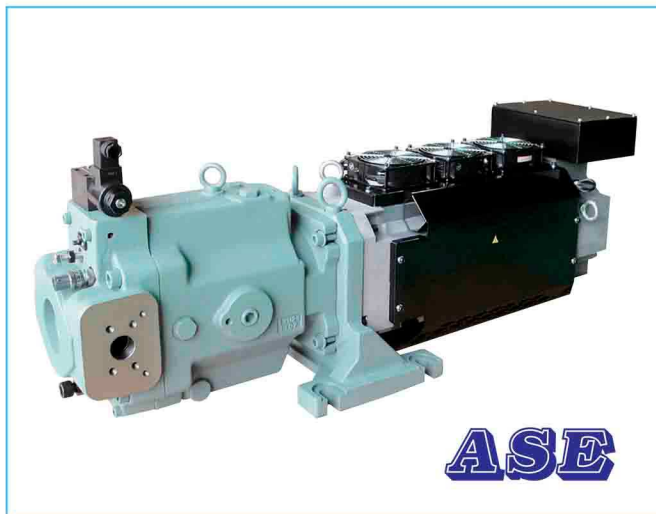


Model Number Designation

| ASR3 | —4 | G | —H | X | S | A100*1 | N*1 | —A | 00 | —11 |
|----------------|---------------------------|----------------|----------------------|------------------------------|----------------------------|---|--|--|------------------|---------------------------|
| Series Numbers | Power Supply Voltage | Power Capacity | Max. Operating Pres. | Flow Setting | Port Direction | Coil Type for Solenoid Operated Directional Valve | Electrical Conduit Conection for Solenoid Operated Directional Valve | Function Selection | Parameter Number | Design Number |
| ASR1 | None: AC200V 4: AC400V | C | H: 21 MPa | X: Single Displacement Type | S: Side None: Axial | AC A100: AC100V A120: AC120V A200: AC200V A240: AC240V DC None: DC24V D12: DC12V D48: DC48V AC (AC → DC) R100: AC100V R200: AC200V | None: Terminal Box N: Plug-in Connector (Optional) | A: Single B: Combination (Single Operation Allowed) | 00: Standard | 11 |
| ASR2 | | C | C: 16 MPa | | | | | | | 11 |
| ASR3 | | E, G | H: 21 MPa | | | | | | | W: Dual Displacement Type |
| ASR5 | | G, J | | 11 | | | | | | |
| ASR10 | | J, M | | A: Horizontal B: Vertical | 12 | | | | | |

*1 Apply to only Flow Setting "W".

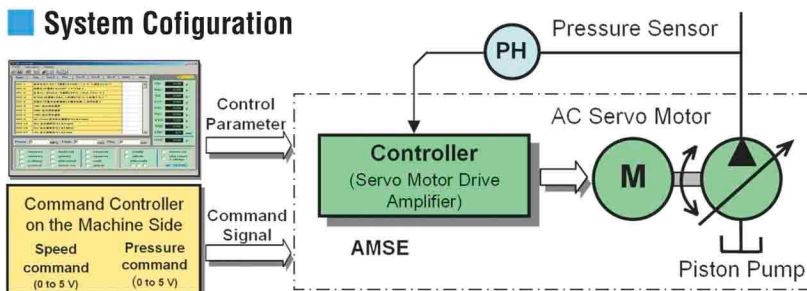
“ASE” Series AC Servo Motor Driven Pumps



Features

- Less wiring/high reliability
Uses sensor-less rotational speed control.
- Space saving/compactness
Integrated motor pump unit.
- Larger motor output
(compared with other products in the same flow capacity range)
Max. motor output is 11 to 35 kW (@ASE15W).
- Easy maintenance
Adopting a cartridge fan and desorption terminals.
- Reduced electrical noise
Using environmentally friendly EMC filter.
- Large flow
Up to 4800 L/min with AMSE combination function and 16 units of ASE15W.

System Configuration

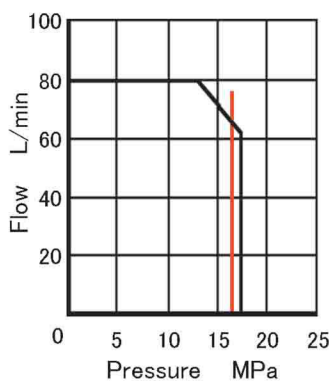


A feedback loop is by the AMSE controller that computes deviations between control signals from the machine side (speed and pressure commands) and sensor signals to drive the AC servo motor accordingly. Control parameters can be set digitally by using dedicated software. The AC servo motor is selected according to the torque and shaft speed required to drive the hydraulic pump. The selection of an appropriate motor for the load condition is important.

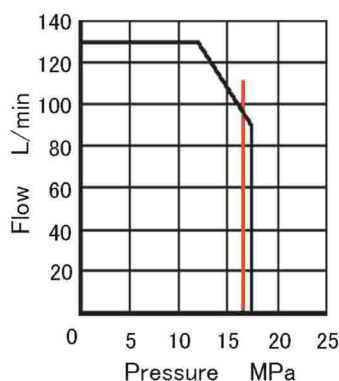
Sample of Pressure-Flow Diagram

- ① Allowable continuous operating pressure: 11 MPa or less
- ② —Max. continuous operating time: 60 s

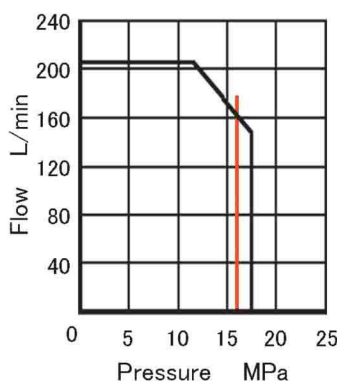
ASE3-4AA-G80



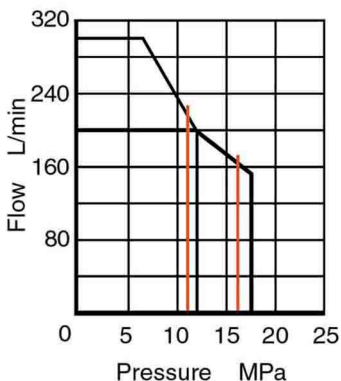
ASE5-4BZ-G130



ASE10-4CE-G200



ASE15W-4CE-G150/100



Model Number Designation

| ASE3 | -4 | AA | -G | 80 | S | A100*2 | N*2 | -A | 00 | 31 |
|----------------|--------------|----------------|----------------------|--|------------------------------|---|---|--|------------------|---------------|
| Series Numbers | Power Supply | Power Capacity | Max. Operating Pres. | Max. Flow | Port Position | Coil Type for Solenoid Operated Directional Valve | Electrical Conduit Connection for Solenoid Operated Directional Valve | Function Selection | Parameter Number | Design Number |
| ASE3 | None: AC200V | AA | G: 17.5 MPa | 80: 80.8 L/min*1 | S: Horizontal B: Vertical | AC A100: AC100V A120: AC120V A200: AC200V A240: AC240V DC None: DC24V D12: DC12V D48: DC48V AC (AC → DC) R100: AC100V R200: AC200V | None: Terminal Box N: Plug-in Connector (Optional) | A: Single B: Combination (Single Use Allowed) | 00: Standard | 31 |
| ASE5 | 4: AC400V | BZ | | 130: 132.7 L/min*1 | | | | | | 31 |
| ASE10 | 4: AC400V | CE | | 200: 205.4 L/min*1 | | | | | | 21 |
| ASE15W | 4: AC400V | CE | | W: User Setting 120/90: Large Flow (Sol OFF) 120 cm³/rev Small Flow (Sol ON) 90 cm³/rev | | | | B: Combination (Single Use Allowed) | | 10 |

*1 In case of Max. Operating Revolution.

*2 Apply to only Series Numbers "ASE15W".

Friendly, Intelligent, Powerful

Vane Pumps

PV2R Series Vane Pumps

These pumps have been developed especially for low noise operation. To comply with a wide range of applications including the injection moulding machines, PV2R Series pumps provide a wide range of output flows, from 5.8 to 237cm³/rev.

- ModelPV2R1, PV2R2, PV2R3, PV2R4 and Double Pumps.
- Max. Operating Pressure21MPa
- Geometric DisplacementPV2R1 : 5.8~31/PV2R2 : 41.3~64.7
PV2R3 : 76.4~115.6/PV2R4 : 136~237cm³/rev

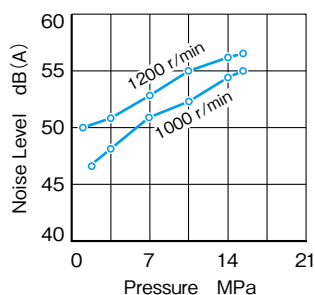


Noise Level

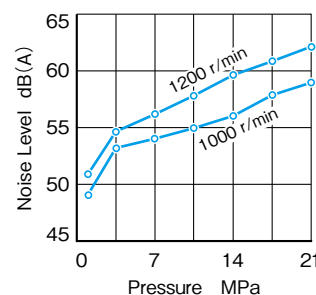
Measuring condition

- Fluid viscosity : 20mm²/s
- Measurement position : One metre horizontally away from pump head cover
- Background noise : 40dB(A)

● PV2R1-31



● PV2R2-65



PV2R4A Series Vane Pumps

These Pumps have been developed to meet space-saving requirements. The pumps have achieved a reduction of 50% in volume and 40% in mass compared to conventional "PV2R4" pumps.

- Model PV2R4A and Duble Pumps
- Max. Operating Pressure 17.2 MPa
- Geometric Displacement 138.5/162.6/194.4 cm³/rev



| Pump Type | Maximum Operating Pressure MPa | Output Flow L/min at 1200 r/min at No-Load | | | | | | | | | | |
|-----------------------------------|--------------------------------|--|---|--------------|----|--------------|-------|--------------|--------|--------|-----|--|
| | | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 500 | 800 | |
| Single Pumps | 7 | | | | | 50T | 150T | | | | | |
| "PV2R" Series Single Pumps | 21 | | | | | PV2R1 | PV2R2 | PV2R3 | PV2R4 | | | |
| "PV2R" Series Double Pumps | 21 | | | Small Volume | | PV2R1 | PV2R2 | PV2R3 | | | | |
| | | | | | | Large Volume | PV2R2 | PV2R3 | PV2R4 | | | |
| "PV2R4A" Series Single Pumps | 17.2 | | | | | | | | | PV2R4A | | |
| "PV2R24A/34A" Series Double Pumps | 21 | | | | | Small Volume | PV2R2 | PV2R3 | | | | |
| | 17.2 | | | | | | | Large Volume | PV2R4A | | | |

Friendly, Intelligent, Powerful

Pressure Control Valves

Various type of pressure control valves are available, from relief valves to pressure switches, to control the pressure at a desired level in the hydraulic system.



Low Noise Type Pilot Operated Relief Valves

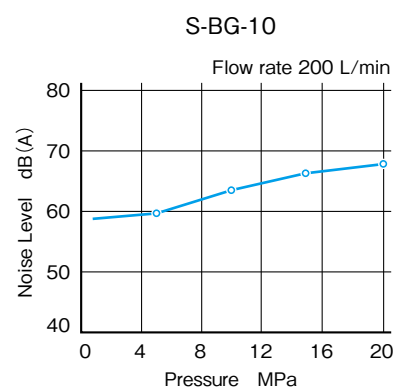
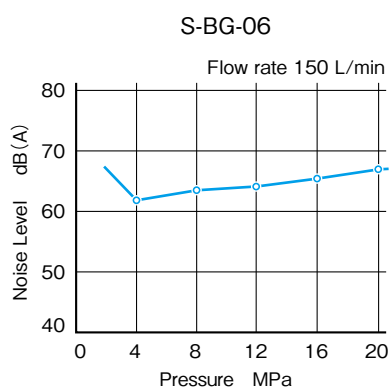
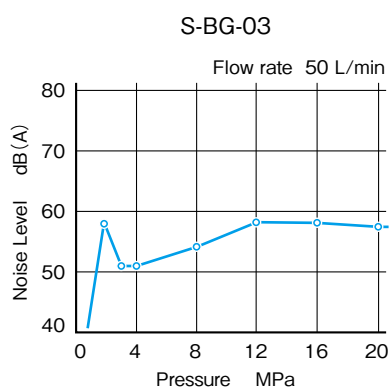
Yuken's pilot operated relief valves here have been particularly developed as low noise type. To protect the pumps and control valves from an excessive pressure, these valves are used to control the pressure in the hydraulic system at a constant level. The remote control and unloading can be done by using the vent circuit.



Noise Level

Measuring condition

Fluid viscosity : 35mm²/s
Measuring position : At one metre back from the valve front.
Tank line back pressure : 0.1MPa



| Valve Type | Maximum Operating Pressure MPa | Max. Flow L/min | | | | | | | | | | | | | | | |
|---|--------------------------------|-----------------|---|---|---|----|-------------------|----|----|-----|-----|-----|-----|------|------|--|--|
| | | 1 | 2 | 3 | 5 | 10 | 20 | 30 | 50 | 100 | 200 | 300 | 500 | 1000 | 2000 | | |
| Remote Control Relief Valves | 25 | DT/DG-01 | | | | | | | | | | | | | | | |
| Direct Type Relief Valves | 21 | DT/DG-02 | | | | | | | | | | | | | | | |
| Pilot Operated Relief Valves | 25 | | | | | | BT/BG | 03 | 06 | 10 | 16 | 24 | | | | | |
| Low Noise Type Relief Valves | 25 | | | | | | S-BG | 03 | 06 | 10 | | | | | | | |
| Solenoid Controlled Relief Valves | 25 | | | | | | BST/BSG | 03 | 06 | 10 | 16 | | | | | | |
| Low Noise Type Sol. Cont. Relief Valves | 25 | | | | | | S-BSG | 03 | 06 | 10 | | | | | | | |
| Brake Valves | 25 | | | | | | UBGR | 03 | 06 | 10 | | | | | | | |
| H/HC Type Pres. Control Valves | 21 | | | | | | HT · HG/HCT · HCG | 03 | 06 | 10 | 16 | | | | | | |
| Pres. Reducing & Check Valves | 21 | | | | | | RT · RG/RCT · RCG | 03 | 06 | 10 | 16 | | | | | | |
| Pres. Reducing & Relieving Valves | 25 | | | | | | RBG | 03 | 06 | | | | | | | | |
| Unloading Relief Valves | 21 | | | | | | BU CG | 03 | 06 | 10 | | | | | | | |
| Pressure Switches | 35 | | | | | | | | | | | | | | | | |

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Flow Control Valves

These valves control the reciprocating and rotating speed of hydraulic actuators. A variety of flow control valves including pressure and/or temperature-compensated flow control valves are available.

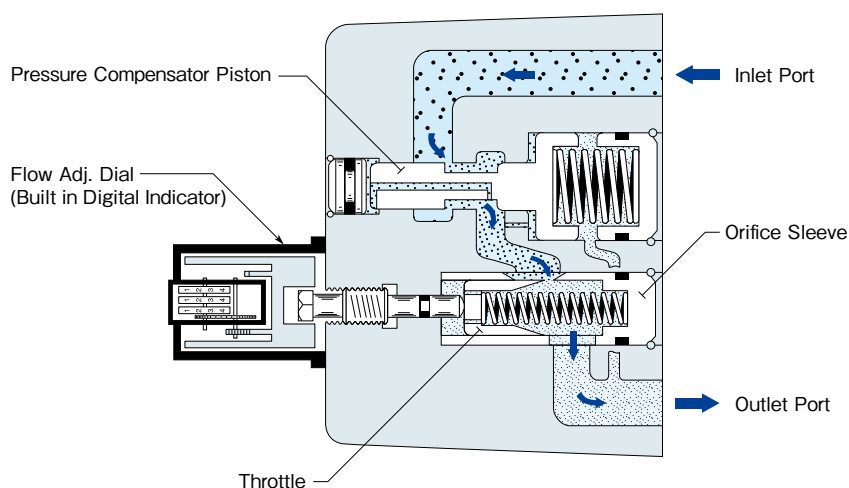


Flow Control Valves/Flow Control and Check Valves

These valves are pressure and temperature compensating type valves and maintain a constant flow rate independent of changes in system pressure (load) and temperature (viscosity of the fluid). These features allow them to control the speed of the actuator precisely. The valves with an integral check valve allow a controlled flow and reverse free flow. Repeated resetting can be made easily with a digital readout.



Flow Control Valves



| Valve Type | Maximum Operating Pressure MPa | Max. Flow L/min | | | | | | | | | | | | | | | | | |
|--|--------------------------------------|-----------------|---|---|---|-----|----|----|----|-----|-----|-----|-----|--------------|------|------|------|--|--|
| | | 1 | 2 | 3 | 5 | 10 | 20 | 30 | 50 | 100 | 200 | 300 | 500 | 1000 | 2000 | 3000 | 5000 | | |
| Flow Control (& Check) Valves | 21 | FG/FCG | | | | 01 | | 02 | | 03 | | 06 | | 10 | | | | | |
| Flow Control & Relief Valves | 25 | FBG | | | | | | | | 03 | | 06 | | 10 | | | | | |
| Pilot Operated Flow Control Valves | 21 | FHG | | | | 02 | | 03 | | 06 | | 10 | | | | | | | |
| Pilot Operated Flow Cont. & Check Valves | 21 | FHCG | | | | 02 | | 03 | | 06 | | 10 | | | | | | | |
| Restrictors | 25 | SRT/SRG | | | | 03 | | 06 | | 10 | | 16 | | (Rated Frow) | | | | | |
| One Way Restrictors | 25 | SRCT/SRCG | | | | 03 | | 06 | | 10 | | 16 | | (Rated Frow) | | | | | |
| Throttle (& Check) Modules | 25 | TC1G/TC2G | | | | 01 | | 03 | | | | | | | | | | | |
| Deceleration (& Check) Valves | 21 | ZTZG/ZCTZCG | | | | 03 | | 06 | | 10 | | | | | | | | | |
| Feed Control Valves | 14 | UCF1G/UCF2G | | | | 01 | | 03 | | 04 | | | | | | | | | |
| Needle Valves | 35 | GCT | | | | -02 | | | | | | | | | | | | | |

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Directional Control Valves

These valves control the flow direction in the hydraulic circuit. The various directional valves ranging from the solenoid operated directional valves to the check valves which conform to JFPS Standard (The Japan Fluid Power Standard) are available to meet the variety in customers' needs.



| Valve Type | Maximum Operating Pressure MPa | Max. Flow L/min | | | | | | | | | | | | |
|---|--------------------------------------|---|---|---|----|----|----|-----|-----|-----|------|------|------|--|
| | | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 500 | 1000 | 2000 | 5000 | |
| Solenoid Operated Directional Valves | 25 | DSG-005/007 | | | | | | | | | | | | |
| | 35 | DSG-01 | | | | | | | | | | | | |
| | 31.5 | DSG-03 | | | | | | | | | | | | |
| Solenoid Controlled Pilot Operated Directional Valves | 21 | DSHG-01 | | | | | | | | | | | | |
| | 25 | DSHG-03 | | | | | | | | | | | | |
| | 31.5 | DSHG 04 06 10 | | | | | | | | | | | | |
| | 21 | DSHF 10 16 24 32 (Rated Flow) | | | | | | | | | | | | |
| Shockless Type Proportional Directional and Flow Control Valves | 25 | EDFG-01 | | | | | | | | | | | | |
| “G”Series Shockless Type Directional Valves | 25 | G-DSG 01 03 | | | | | | | | | | | | |
| | | G-DSHG 04 06 | | | | | | | | | | | | |
| Poppet Type Solenoid Operated Directional Valves | 31.5 | DSLГ-01 | | | | | | | | | | | | |
| Multi Purpose Control Valves | 25 | DSLHG 04 06 10 | | | | | | | | | | | | |
| Solenoid Operated Poppet Type Two-Way Valves | 14 | CDS※-03 | | | | | | | | | | | | |
| Shut-off Type Solenoid Operated Directional Valves | 25 | DSPC/DSPG 01 03 | | | | | | | | | | | | |
| Pilot Operated Directional Valves | 31.5 | DHG 04 06 10 | | | | | | | | | | | | |
| Manually Operated Directional Valves | 21 | Threaded connection (DMT) 03 06 10 | | | | | | | | | | | | |
| | 31.5 | Sub-plate mounting (DMG) 01 03 04 06 10 | | | | | | | | | | | | |
| Mechanically Operated Directional Valves | 7 | Rotary type DR ^T _G -02 | | | | | | | | | | | | |
| | 25 | Cam operated(DC ^T _G) 01 03 | | | | | | | | | | | | |
| Check Valves | 25 | In-line(CIT) 02 03 06 10 (Rated Flow) | | | | | | | | | | | | |
| | | Right angle(CRT/CRG) 03 06 10 (Rated Flow) | | | | | | | | | | | | |
| | | Right angle, Flanged connection(CRF) 10 16 24 (Rated Flow) | | | | | | | | | | | | |
| Pilot Controlled Check Valves | 25 | Threaded connection(CP※ ^T _G) Sub-plate mounting(CP※ _G) 03 06 10 (Rated Flow) | | | | | | | | | | | | |
| | | Flanged connection(CP※F) 10 16 (Rated Flow) | | | | | | | | | | | | |

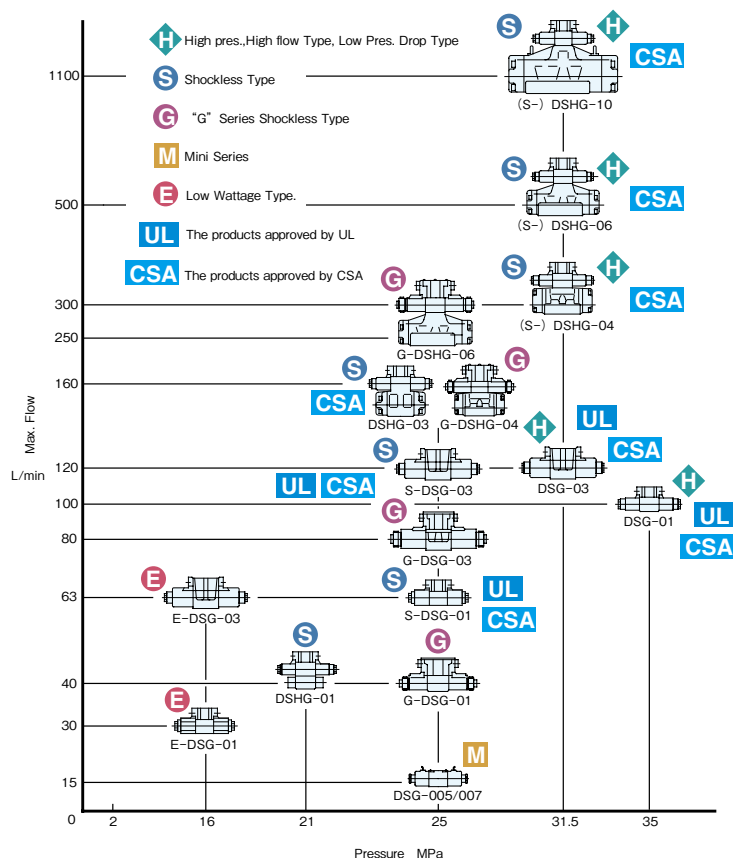
Solenoid Operated Directional Valves / Solenoid Controlled Pilot Operated Directional Valves

The following is our full range of solenoid operated directional valves and solenoid controlled pilot operated directional valves.



WIDE RANGE OF MODELS

Choose the optimum valve from a large selection to meet your needs.



Shockless Type Proportional Directional and Flow Control Valves / Amplifiers

Shockless type proportional and flow control valves have been developed by employing the basic design concept of "G" series solenoid operated directional valves.

The maximum speed of actuators can be controlled optionally as the shockless type directional and flow control valves have maximum flow rate adjustment functions, features which are not available on the "G" series solenoid operated directional valves.

The power amplifiers for use with the shockless type directional and flow control valves have digital setting systems allowing for excellent operational maneuverability and repeatability. They offer two types of slop mode ; "SLOPE CONSTANT" and "TIME CONSTANT", and nine different types of shockless curves (one straight line slope and eight waveforms). The optimum setting can be selected to suit any load condition.

Shockless Type Proportional Directional and Flow Control Valves

- Model EDFG-01
- Rated Flow 30L / min
- Max. Operating Pres. 25MPa



Amplifier

- Model AMN-G
- Power Supply DC 24V (20~30V)
- Max. Input Power 35W





Series Shockless Type Solenoid Operated Directional Valves

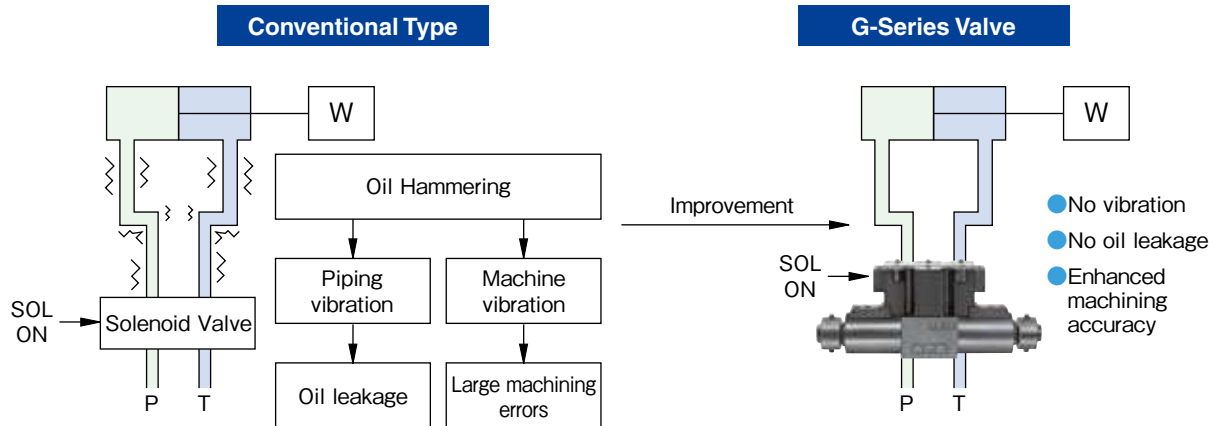
The G series solenoid operated directional valve reduces any shocks that may arise when starting machinery or shifting the spool.

These valves feature less pipe leakage and offer more accurate control and improve the reliability of the machinery on which they are used.

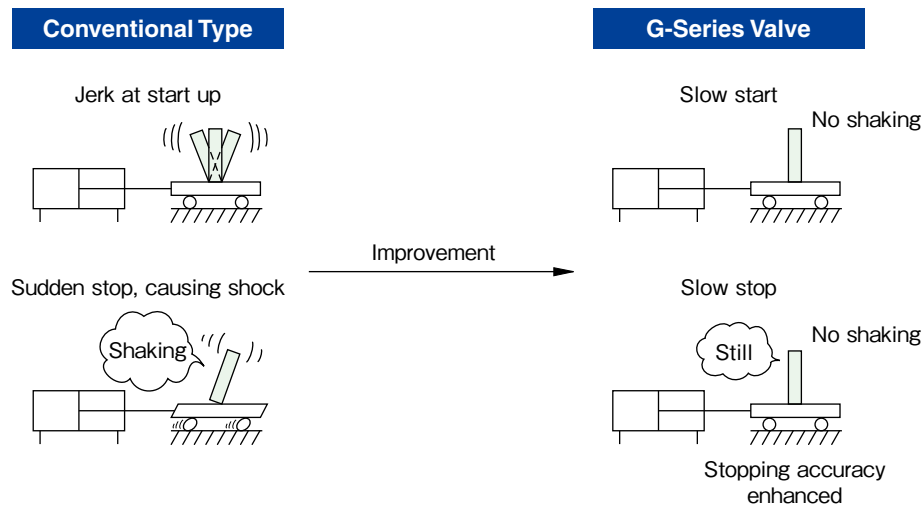


● Your valuable machines are protected from vibration and shocks

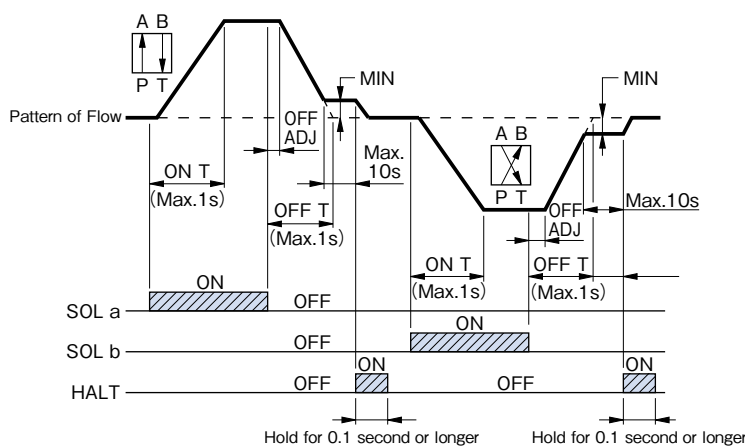
■ Shocks caused by acceleration and deceleration are reduced.



■ Oil hammering during spool shifting is reduced.



■ Relationships between SOL signals and flow patterns

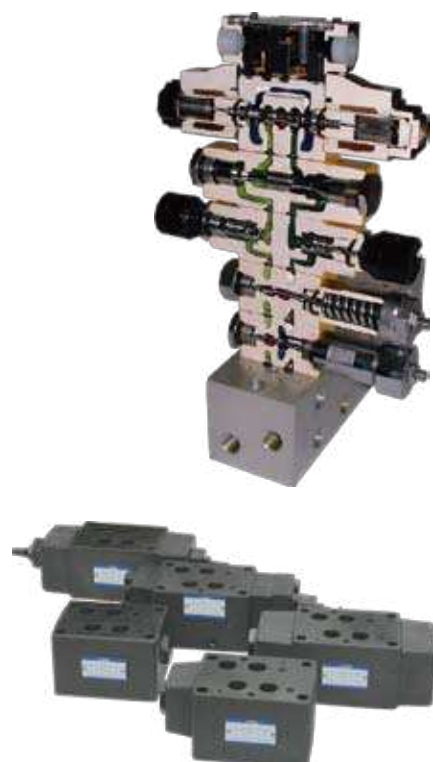


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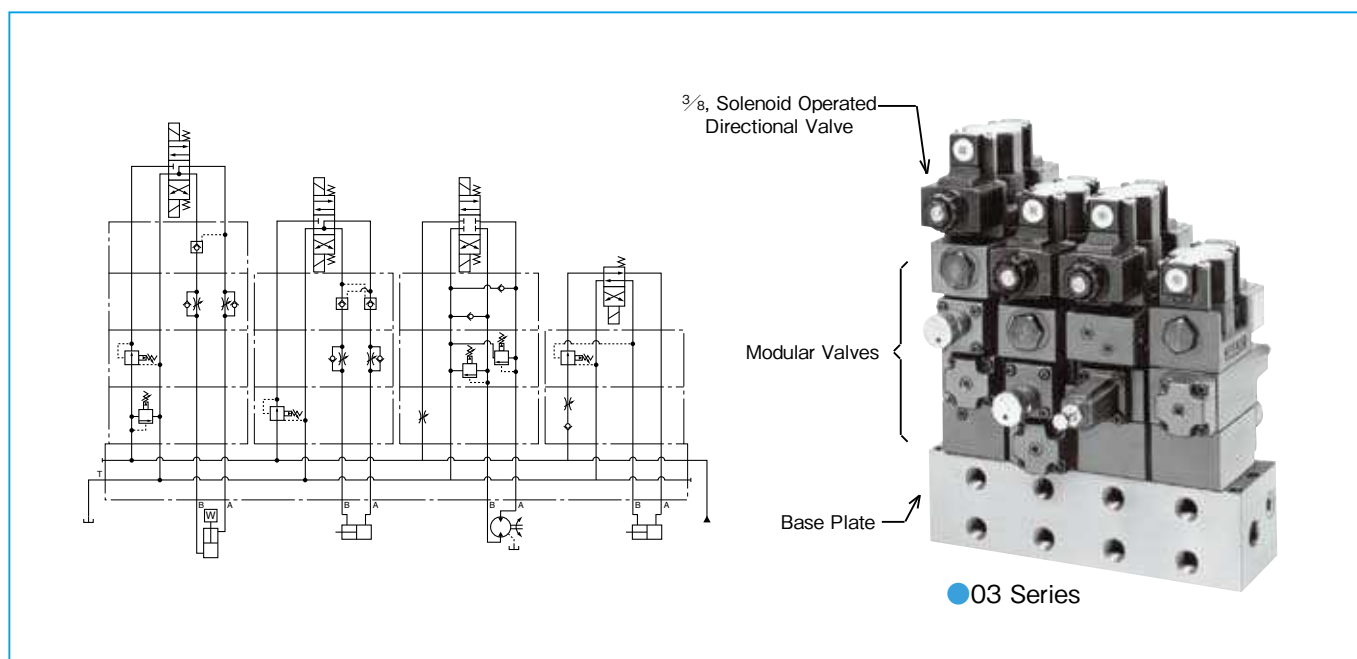
Modular Valves

YUKEN MODULAR VALVES are designed to simplify hydraulic systems, to eliminate the use of pipe connections and to save space, time and costs. The modular valves have standardized interfaces (ISO 4401, CETOP, NFPA) and thickness in accordance with each valve size. Any hydraulic circuit can be created by stacking the modular valves in the correct sequence one upon another and bolting the various stacks to a common manifold base.

- Modular valves remarkably minimize the installation area and space.
- No expert skill is required to assemble. Changes or additions to the circuit can be easily and quickly carried out.
- Problems such as oil leaks, vibration and noise which may arise from pipes and tubes are minimized because pipes and tubes are not necessary.
- The simple installation method of modular valves allows for easy maintenance.



Stacking Example

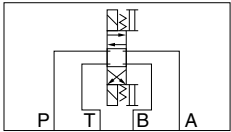
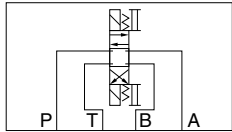
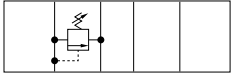
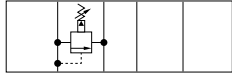
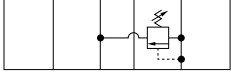
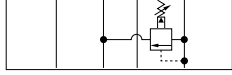
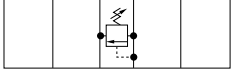
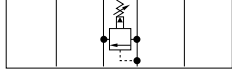
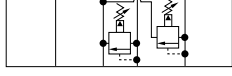
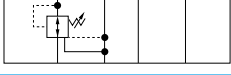
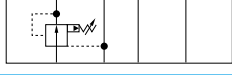
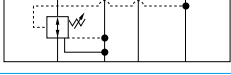



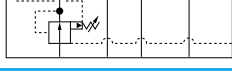
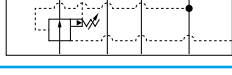






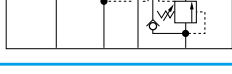
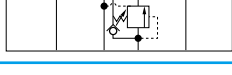
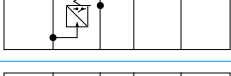
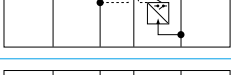
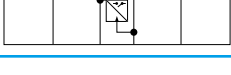


| Valve Type | Maximum Operating Pressure MPa | Max. Flow L/min | | | | | | | | | | |
|-------------------------------|--------------------------------|-----------------|---|---|----|----|----|-----|-----|-----|------|--|
| | | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 500 | 1000 | |
| 005/007 Series Modular Valves | 25 | | | | | | | | | | | |
| 01 Series Modular Valves | 31.5 | | | | | | | | | | | |
| 03 Series Modular Valves | 25 | | | | | | | | | | | |
| 04 Series Modular Valves | 35 | | | | | | | | | | | |
| 06 Series Modular Valves | 25 | | | | | | | | | | | |
| 10 Series Modular Valves | 25 | | | | | | | | | | | |

★Max Flow for Throttle and Check Modular Valves.

List of 005/007/01/03 Series Modular Valves (Pressure Controls)

● Pressure Controls

| Name | Graphic Symbols | Model Numbers | Graphic Symbols | Model Numbers |
|---|---|------------------------------|--|---------------|
| | | "005/007/01" Series | | "03" Series |
| Solenoid Operated Directional Valves |  | DSG-005 DSG-007 DSG-01 |  | DSG-03 |
| Relief Modular Valves |  | MBP-005 |  | MBP-03 |
| |  | MBP-01 MBA-01 |  | MBA-03 |
| |  | MBB-01 |  | MBB-03 |
| | — | |  | MBW-03 |
| Reducing Modular Valves |  | MRP-005 MRP-007 MRP-01 |  | MRP-03 |
| |  | MRA-01 |  | MRA-03 |
| |  | MRB-01 |  | MRB-03 |
| Reducing Modular Valves for Low Pressure Setting | — | |  | MRLP-03 |
| | — | |  | MRLA-03 |
| | — | |  | MRLB-03 |
| Reducing Modular Valves for Two Pressures Setting |  | MRDP-01 | — | |
| Brake Modular Valves |  | MBR-01 | — | |
| Sequence Modular Valves |  | MHP-01 |  | MHP-03 |
| Counterbalance Modular Valves |  | MHA-01 |  | MHA-03 |
| | — | |  | MHB-03 |
| Pressure Switch Modular Valves |  | MJP-01-M | — | |
| |  | MJA-01-M | | |
| |  | MJB-01-M | | |

List of 005/007/01/03 Series Modular Valves (Flow Controls, Directional Controls, Others)

● Flow Controls

| Name | Graphic Symbols P T B A | Model Numbers |
|---|----------------------------|--|
| Flow Control Modular Valves | | MFP-01 MFP-03 |
| Flow Control and Check Modular Valves | | MFA-01-X MFA-03-X |
| | | MFA-01-Y MFA-03-Y |
| | | MFB-01-X MFB-03-X |
| | | MFB-01-Y MFB-03-Y |
| | | MFW-01-X MFW-03-X |
| | | MFW-01-Y MFW-03-Y |
| Temperature Compensated Throttle and Check Modular Valves | | MSTA-01-X MSTA-03-X |
| | | MSTB-01-X MSTB-03-X |
| | | MSTW-01-X MSTW-03-X |
| Throttle Modular Valves | | MSP-01 MSP-03 |
| Throttle and Check Modular Valves | | MSCP-01 MSCP-03 |
| | | MSA-005-X MSA-007-X MSA-01-X MSA-03-X |
| | | MSA-005-Y MSA-007-Y MSA-01-Y MSA-03-Y |
| | | MSB-005-X MSB-007-X MSB-01-X MSB-03-X |
| | | MSB-005-Y MSB-007-Y MSB-01-Y MSB-03-Y |
| | | MSW-005-X MSW-007-X MSW-01-X MSW-03-X |
| | | MSW-005-Y MSW-007-Y MSW-01-Y MSW-03-Y |
| | | MSW-01-XY |
| | | MSW-01-YX |

● Directional Controls

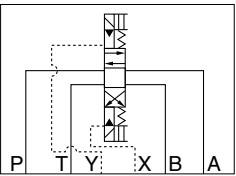

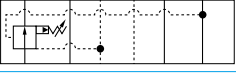

| Name | Graphic Symbols P T B A | Model Numbers |
|-------------------------------------|----------------------------|--|
| Check Modular Valves | | MCP-005 MCP-01 MCP-03 |
| | | MCA-03 |
| | | MCB-03 |
| | | MCT-01 MCT-03 |
| Anti-Cavitation Modular Valves | | MAC-01 MAC-03 |
| | | MPA-01 MPA-007 MPA-007 |
| Pilot Operated Check Modular Valves | | MPB-005 MPB-007 MPB-01 MPB-03 |
| | | MPW-005 MPW-005 MPW-01 MPW-03 |

● Modular Plates and Mounting Bolts

| Name | Graphic Symbols P T B A | Model Numbers |
|-------------------|----------------------------|--|
| End Plates | | MDC-005-A MDC-007-A MDC-01-A MDC-03-A |
| | | MDC-01-B MDC-03-B |
| Connecting Plates | | MDS-01-PA |
| | | MDS-01-PB |
| | | MDC-01-AT |
| | | MDS-03 |
| Base Plates | | MMC-005 MMC-007 MMC-01 MMC-03 |
| Bolt Kits | | MBK-005 MBK-007 MBK-01 MBK-03 |

List of 04/06/10 Series Modular Valves (Pressure Controls, Flow Controls, Directional Controls)

● Pressure Controls

| Name | Graphic Symbols | Model Numbers |
|---|---|-------------------------------|
| Solenoid Controlled Pilot Operated Directional Valves |  | DSHG-04 DSHG-06 DSHG-10 |
| |  | MRP-04 MRP-06 MRP-10 |
| |  | MRA-04 MRA-06 MRA-10 |
| Reducing Modular Valves |  | MRB-04 MRB-06 MRB-10 |


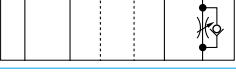
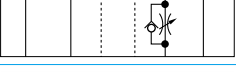

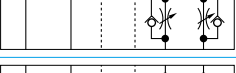



005 Series
MSW-005



007 Series
MRP-007

● Flow Controls

| Name | Graphic Symbols | Model Numbers |
|--------------------------------------|---|----------------------------------|
| Throttle and Check Modular Valves |  | MSA-04-X MSA-06-X MSA-10-X |
| |  | MSA-04-Y MSA-06-Y MSA-10-Y |
| |  | MSB-04-X MSB-06-X MSB-10-X |
| |  | MSB-04-Y MSB-06-Y MSB-10-Y |
| |  | MSW-04-X MSW-06-X MSW-10-X |
| |  | MSW-04-Y MSW-06-Y MSW-10-Y |

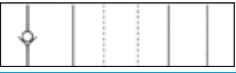

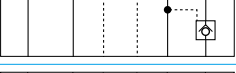
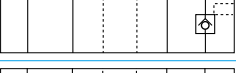
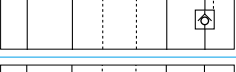
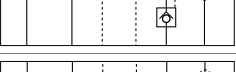

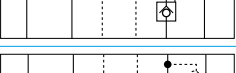
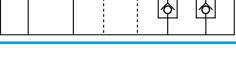


01 Series
MSW-01



03 Series
MPW-03

● Directional Controls

| Name | Graphic Symbols | Model Numbers |
|--|---|------------------------------|
| Check Modular Valves |  | MCP-04 |
| |  | MCT-04 |
| Pilot Operated Check Modular Valves |  | MPA-04 MPA-06 MPA-10 |
| |  | MPA-06 ※-※-X MPA-10 ※-※-X |
| |  | MPA-06 ※-※-Y MPA-10 ※-※-Y |
| |  | MPB-04 MPB-06 MPB-10 |
| |  | MPB-06 ※-※-X MPB-10 ※-※-X |
| |  | MPB-06 ※-※-Y MPB-10 ※-※-Y |
| |  | MPW-04 MPW-06 MPW-10 |
| Mounting Bolt Kits | — | MBK-04 MBK-06 MBK-10 |



04 Series
MRP-04



06 Series
MPW-06



10 Series
MSW-10

Proportional Electro-Hydraulic Controls

EH Series Proportional Electro-Hydraulic Control Valves

The EH Series on-board electronic proportional controls are compound electro-hydraulic products which merge the latest electronic and sensor technology with Yuken's reputable E Series proportional controls. Yuken has realized an industry leading position by creating compact hydraulic equipment that features high precision and reliability by unifying the amplifier, and sensor, all of which are required for proportional or servo control systems.



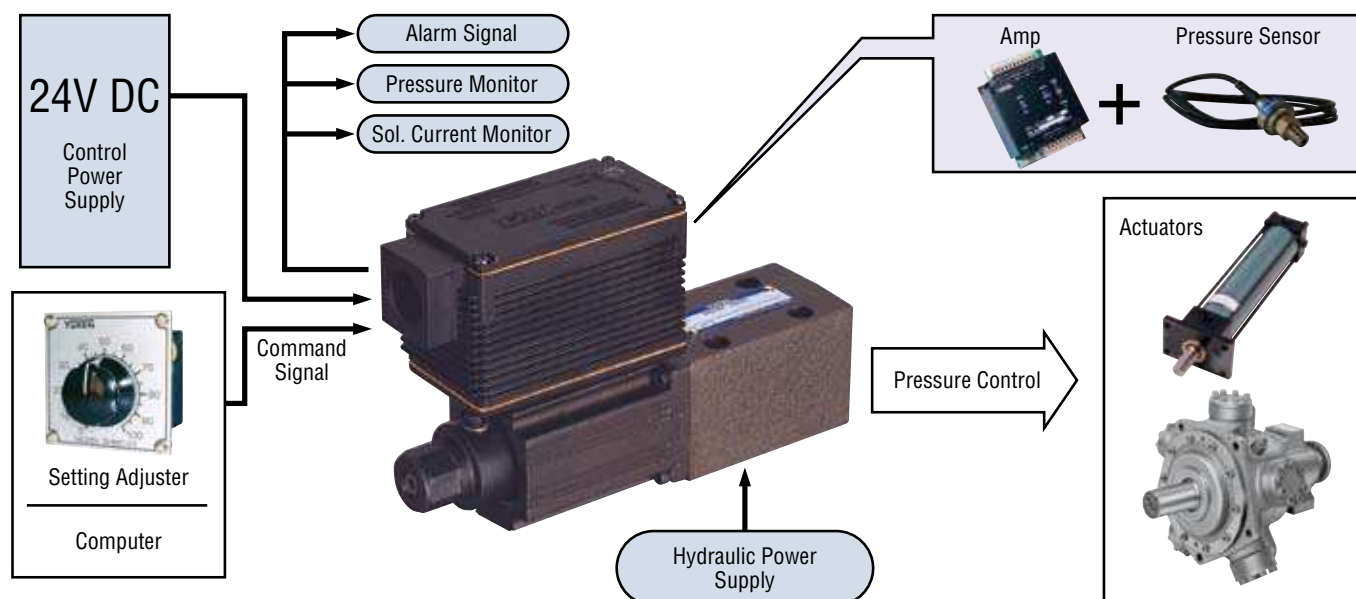
- Proportional control systems or servo systems can be easily structured by simply preparing the power source (DC) for controls and command signals along with the hydraulic source.

Amplifiers exclusively used for the system or separately installed control panels are unnecessary.

- By using built-in sensors;

- (1) pressure and orifice openness, which can be converted to flow rate, can be detected and controlled remotely.
- (2) along with a compound amplifier, a closed loop system can be structured.
- (3) sensor output signals or deviation signals at structuring closed loop system can be monitored.

- Disadvantages seen in ordinary hydraulic systems in which hydraulic components, sensors and amplifiers are interconnected with each other but installed separately are eliminated.



| Valve Type | Maximum Operating Pressure MPa | Max. Flow L/min | | | | | | | | | | | | | |
|---|--------------------------------------|-----------------|---|---|---|----|----|----|----|--------|-----|-----|-----|------|--|
| | | 1 | 2 | 3 | 5 | 10 | 20 | 30 | 50 | 100 | 200 | 300 | 500 | 1000 | |
| Pilot Relief Valves | 24.5 | EHDG-01 | | | | | | | | | | | | | |
| Pressure Control Valves | SB1110 : 24.5 SB1190 : 7.0 | SB1110 | | | | | | | | SB1190 | | | | | |
| Relief Valves | 24.5 | EHBG | | | | | | | | | 03 | 06 | 10 | | |
| Reducing & Relieving Valves | 24.5 | EHRBG | | | | | | | | | 06 | 10 | | | |
| Flow Control (& Check) Valves | 03 : 20.6 06 : 24.5 | EHFG/EHFCG | | | | | | | | | 03 | 06 | | | |
| Flow Control & Relief Valves | 24.5 | EHFBG | | | | | | | | | 03 | 06 | 10 | | |
| High Flow Series Flow Control & Relief Valves | 24.5 | EHFBG | | | | | | | | | 03 | 06 | | | |
| Directional & Flow Cont. Valves | 25 | EHDFG | | | | | | | 01 | 03 | | | | | |
| High Response Type Directional & Flow Cont.Valves | 15.7 | EHDFG | | | | | | | | | 04 | 06 | | | |

Note) Setting adjusters are also available.

Series Proportional Electro-Hydraulic Control Valves

Proportional valves are able to control the system pressure or flow proportionally through a controlled input current from the amplifier.

Our product line includes “high response type valves” that provide ultimately improved response using closed loop control that proportional control valves can offer.



| Valve Type | Maximum Operating Pressure MPa | Max. Flow L/min | | | | | | | | | | | | | |
|---|--------------------------------------|----------------------------------|---|-----|---|----|----|----|----|-----|-----|-----|-----|------|--|
| | | 1 | 2 | 3 | 5 | 10 | 20 | 30 | 50 | 100 | 200 | 300 | 500 | 1000 | |
| Pilot Relief Valves | 24.5 | EDG-01 | | | | | | | | | | | | | |
| Relief Valves | 24.5 | | | EBG | | | | | | 03 | 06 | 10 | | | |
| Reducing & Relieving Valves | 24.5 | ERBG | | | | | | | | 06 | 10 | | | | |
| Flow Control (& Check) Valves | 20.6 | EFG/EFCG (40ΩSeries) 02 03 06 10 | | | | | | | | | | | | | |
| | 24.5 | EFG/EFCG (10ΩSeries) 03 06 | | | | | | | | | | | | | |
| Flow Control & Relief Valves | 24.5 | EFBG (40Ω-10Ω Series) 03 06 10 | | | | | | | | | | | | | |
| | | EFBG (10Ω-10Ω Series) 03 06 10 | | | | | | | | | | | | | |
| | | EFBG (High Flow Series) 03 06 | | | | | | | | | | | | | |
| High Response Type Flow Control & Relief Valves | 25 | ELFBG-03 | | | | | | | | | | | | | |
| Directional & Flow Cont. Valves | 25 | EDFG-01 | | | | | | | | | | | | | |
| Directional & Flow Cont. Valves | 25 | EDFHG 03 04 06 | | | | | | | | | | | | | |
| High Response Type Proportional Directional and Flow Control Valves | 31.5 | ELDFG 01 03 | | | | | | | | | | | | | |
| | 35 | ELDFHG 03 04 06 | | | | | | | | | | | | | |

Note) Power amplifiers and setting adjusters are also available.

Amplifiers

| Amplifier Type | Model Numbers | Applicable to Control Valve |
|------------------------------|-------------------|---|
| DC Input | AME-D-10-※-20 | Pressure or Flow Control (For 10Ω Sol.) |
| | AME-D-40-※-40 | Flow Control (For 40Ω Sol.) |
| | AME-D2-H1-※-12 | Flow Control and Relief (For 40Ω -10Ω Sol.) |
| | AME-D2-1010-※-11 | Flow Control and Relief (For 10Ω -10Ω Sol.) |
| DC Input-Feedback | SK1022-※-※-11 | Pressure or Flow Control (For 10Ω Sol.) |
| | AME-DF-S-※-22 | Flow Control (For 10Ω Sol.) |
| Slow Up-Down | AME-T-S-※-22 | Flow Control (For 40Ω Sol.) |
| DC Input For DC Power 24V DC | SK1015-11 | Pressure or Flow Control (For 10Ω Sol.) |
| | AMN-D-10 | |
| | AMN-W-10 | |
| | SK1091-D24-10 | Directional and Flow Control |
| DC Input with Minor Feedback | AMN-L-01-※-※-10 | High Response Type Directional and Flow Control |
| | AMB-EL-※-※-※-※-10 | |
| Shockless | AMN-G-10 | Shockless Directional and Flow Control |



Friendly, Intelligent, Powerful

Linear Servo Valves

High-speed Linear Servo Valves/Servo Amplifiers

High-speed linear servo valves have outstanding features of high response and exceptional contamination resistance. These features are achieved by the compact and powerful linear motor which directly drives the spool and gives electric feedback of the spool position. These valves have garnered an excellent reputation since their launch by Yuken in 2001.

High Response

High Accuracy

Excellent contamination resistance



LSVHG-06



LSVG-03

On-board Electronics Type Linear Servo Valves

On-board electronics type linear servo valves have been developed based on high-speed linear servo valves, but with a focus on downsizing the pilot valve. The integration of the exclusive amplifier and the linear servo valve create a high performance valve in a compact package which greatly improves user-friendliness.

Convenient

High Accuracy

Simple












LSVHG-03EH

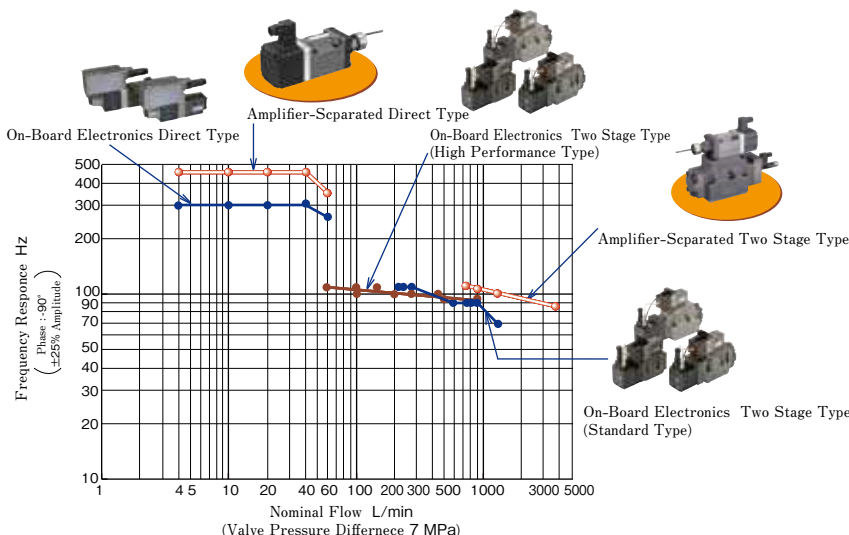


LSVG-01EH

Specifications

| Valve Type | | Max. Operating Press. MPa | Nominal Flow L/min (Valve Pressure Differnece 7 MPa) | | | | | | | | | | | | | | | | Frequency Response ±25% Amplitude 90° Phase Hz | Step Response 0→100% ms | Spool Type | | |
|---|----------------|---------------------------|--|---|---|----|----|----|----|-----|-----|-----|-----|------|------|------|--|--|---|-------------------------------|---|---|---|
| | | | 1 | 2 | 5 | 10 | 20 | 30 | 50 | 100 | 200 | 300 | 500 | 1000 | 2000 | 5000 | | | | | | | |
| High-Speed Linear Servo Valves (Amplifier-Separated Type) | Direct Type | 35 | LSVG-03 4, 10, 20, 40, 60 | | | | | | | | | | | | | | | | 450, 350 | 2,3 | Neutral Zero lap  | | |
| | Two Stage Type | 35 | LSVHG-04 750 | | | | | | | | | | | | | | | | 110 | 8 | 2:10% Overlap  | 2P: Zero lap (Dual Flow Gain)  | 40:A,B,T Connection  |
| | | 900:35 1300:31.5 | LSVHG-06 900, 1300 | | | | | | | | | | | | | | | | 105, 100 | 8,10 | | | |
| | | 35 | LSVHG-10 3800 | | | | | | | | | | | | | | | | 85 | 15 | | | |
| On-Board Electronic Type Linear Servo Valves (Standard Type) | Direct Type | 35 | LSVG-01EH 4, 10, 20 | | | | | | | | | | | | | | | | 300 | 3 | Neutral Zero lap  | | |
| | | 35 | LSVG-03EH 40, 60 | | | | | | | | | | | | | | | | 310, 260 | 3,4 | | | |
| | Two Stage Type | 31.5 | LSVHG-03EH 210, 270 | | | | | | | | | | | | | | | | 110 | 7,8 | 2:10% Overlap  | 2L:2% Overlap (Linear Flow Gain)  | 2P:Zero lap (Dual Flow Gain)  |
| | | 35 | LSVHG-04EH 580, 750 | | | | | | | | | | | | | | | | 90 | 11 | | | |
| | | 820,900:35 1300:31.5 | LSVHG-06EH 820, 1300 | | | | | | | | | | | | | | | | 90, 70 | 11,15 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| On-Board Electronic Type Linear Servo Valves (High Performance Type) | Two Stage Type | 31.5 | LSVHG-03EH-※-S 60, 100, 160 | | | | | | | | | | | | | | | | 110 | 7 | S:1% Overlap  | | |
| | | 35 | LSVHG-04EH-※-S 100, 200, 280, 450 | | | | | | | | | | | | | | | | 100 | 11 | | | |
| | | 35 | LSVHG-06EH-※-S 500, 900 | | | | | | | | | | | | | | | | 95 | 12 | | | |

Frequency Response Chart



Winning
The 2010 JSME*
Excellent Product Award

* The Japan Society of Mechanical Engineers

High-speed Linear Servo Valves/Servo Amplifiers

Linepu covering a high response of 450 Hz (direct type)/a high flow of 3800 L/min (two stage type) !

High precision and fast responsiveness are achieved by driving the spool directly using a compact, powerful linear motor as well as by feedback of the spool position.

● 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

Compared to conventional servo valves for which the permissible contamination level is up to NAS 1638 class 7, the direct type servo valves can accept the contamination level of up to class 10.



Two Stage Type — LSVHG-06



Direct Type — LSVG-03

Linear Servo Amplifiers — AMLS

On-board Electronics Type Linear Servo Valves

Introducing new direct type models (LSVG-01EH/03EH): Wider range of products !

On-board electronics type linear servo valves have been developed based on the high-speed linear servo valves while aiming at downsizing the pilot valve and improving user-friendliness by integrating the exclusive amplifier and the high-speed linear servo valve compactly.

● High accurate, simple and convenient — Ideal on-board electronics type linear servo valves

Convenient

Fault diagnosis is easy to conduct with the alarm indication when the command signal and the spool position differ due to abnormality in the system.

| Colour | Description of Alarm Indicator |
|--------|---|
| Green | Indication of power supply (Normal operation) |
| Red | Deviation alarm for the pilot valve |
| Yellow | Deviation alarm for the main valve |

Simple

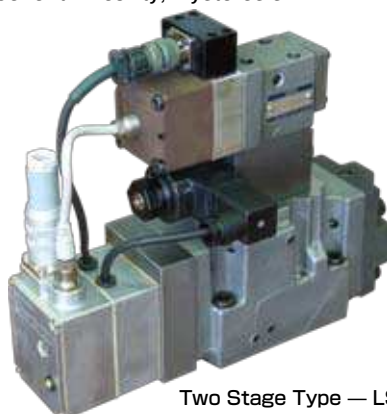
Highly accurate hydraulic control can be obtained only by supplying 24 V DC power and inputting a command signal voltage of 0 to $\pm 10V$, 0 to $\pm 10mA$ and 4 to 20 mA.

High Accuracy

Closed loop control by the combination of the position sensors for the pilot valve and the main valve in the compact amplifiers ensures excellent linearity, hysteresis and stability on control.



Direct Type — LSVG-01EH



Two Stage Type — LSVHG-04EH
with Fail-Safe Solenoid Operated Valve



Energy-Saving Hydraulic Units and Controllers

● Substantial energy saving of hydraulic units has been achieved by the inverter drive.

Hydraulic units equipped with variable displacement pumps feature greater energy-saving than those with fixed displacement pumps.

Yuken's energy-saving hydraulic units and controllers utilize rotational frequency control with an inverter. This innovative configuration solves the problem of efficiency losses suffered by induction motors operating at light loads and ensures significant energy savings.



Efficiency Characteristics of Induction Motors

- At Rated Output : Maximum Efficiency
- At light-load : Significant Efficiency loss

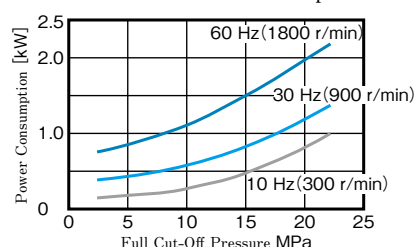
● Rotational frequency control is effective for reducing power loss.

Extensive energy saving is possible by detecting a load pressure with the pressure sensor and keeping the motor rotation at the optimum level required for pressure holding. Based on the concept above, the following two different types of inverter-driven system and packages have been developed.

- Energy-saving control system for hydraulic units (Energy saving controller)
- For modification of existing hydraulic units to energy-saving type
- Equipped with the variable displacement piston pump <YA-e Pack>

● Example of Reduction of Power Consumption with Rotational Frequency Control

Combination of the AR22 Piston Pump and 7.5 kW Motor



Energy-saving control system for hydraulic units (Energy saving controller)

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

System Configuration

The following 5 monitoring figures can be indicated.

- ① Input voltage or pressure for Pressure sensor
- ② Inverter output (r/min)
- ③ Simple arithmetic figure for Power (kW)
- ④ Sequence input code
- ⑤ Alarm output code

Controller for setting rotational frequency of the inverter
AMC-IV-2-10

Pressure Sensor



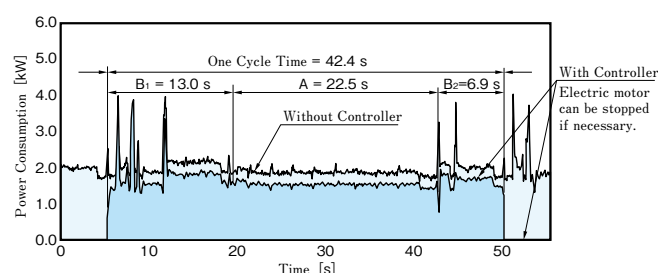
Inverter



Existing Hydraulic Power Unit

- Applicable Induction Motor : 0.75 to 7.5 kW
- Applicable Pump : Variable displacement Piston Pump

Example of Reduction Rate of Power Consumption (Machining line for auto parts)



| Symbol | Status | Average of Power Consumption | | |
|--------------------------------------|-------------|------------------------------|-----------------|----------------|
| | | Without Controller | With Controller | Reduction Rate |
| A | Standby | 1.80 kW | 1.47 kW | Approx. 18% |
| B₁ + B₂ | Actual Work | 2.01 kW | 1.69 kW | Approx. 16% |

Specifications

- Model AMC-IV-2-10
- Output Voltage for Inverter ... Select one of the following voltage (0 to +5 V, +1 to +5 V, +0.5 to +5 V)
- Input Voltage for Pressure Sensor ... Select one of the following voltage (0 to +5 V, +1 to +5 V, +0.5 to +5 V)
- Power Supply for Pressure Sensor ... +5 V
- Voltage for Power Source AC 100/200 V
- Power Consumption Less than 6 VA
- Ambient Temperature 0 to 50 °C

Friendly, Intelligent, Powerful

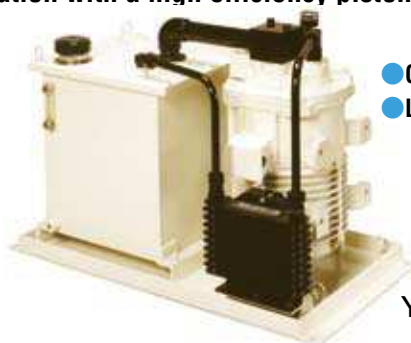
Standard Hydraulic Power Units

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



YF Pack

- Compact and lightweight
- Low noise level



YP Pack

- Compact and lightweight
- Low noise level



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.



- Compact and lightweight
- Low noise level

YA-Light

YA Series L Pack

| Hydraulic Power Unit Type | Model Numbers | Max.Operating Pressure MPa | Reservoir Capacity L | | | | | | | | Geometric Displacement cm ³ /rev | | | | | | Electric Motor kW×4P |
|---|---------------|----------------------------|----------------------|---|---|----|----|----|-----|-----|---|---|---|----|----|---------------------|----------------------|
| | | | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 1 | 2 | 5 | 10 | 20 | 50 | |
| Standard Hydraulic Power Unit YF Pack | YF10 | 16 | | | | | | | | | | | | | | | 0.75/1.5 |
| | YF16 | | | | | | | | | | | | | | | | 1.5/2.2 |
| Standard Hydraulic Power Unit YP Pack | YP10 | 7/16 | | | | | | | | | | | | | | | 0.75/1.5 |
| | YP16 | 16 | | | | | | | | | | | | | | | 1.5/2.2 |
| | YP22 | | | | | | | | | | | | | | | 2.2/3.7 | |
| | YP37 | | | | | | | | | | | | | | | 3.7/5.5 | |
| Standard Hydraulic Power Unit YA Pack | YA10 | 7/16 | | | | | | | | | | | | | | | 0.75/1.5/2.2/3.7 |
| | YA16 | | | | | | | | | | | | | | | 1.5/2.2/3.7/5.5/7.5 | |
| | YA22 | | | | | | | | | | | | | | | 2.2/3.7/5.5/7.5 | |
| | YA37 | 7 | | | | | | | | | | | | | | 3.7/5.5/7.5 | |
| Standard Hydraulic Power Unit YA Series L Pack | YAL8 | 3.5/7 | | | | | | | | | | | | | | | 0.75/1.5 |
| | YAL16 | | | | | | | | | | | | | | | | 1.5/2.2 |
| Energy-Saving Hydraulic Power Unit YA-e Pack | E-YA10 | 7/16 | | | | | | | | | | | | | | | 2.2/3.7 |
| | E-YA16 | | | | | | | | | | | | | | | 1.5/2.2/3.7/5.5/7.5 | |
| | E-YA22 | | | | | | | | | | | | | | | 2.2/3.7/5.5/7.5 | |
| | E-YA37 | 7 | | | | | | | | | | | | | | 3.7/5.5/7.5 | |
| Energy-Saving Control System for Hydraulic Unit | AMC-IV | — | — | | | | | | | | — | | | | | | — |

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■ Affiliated Company ● Distributor ◆ Service Center

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