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YUKEN

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

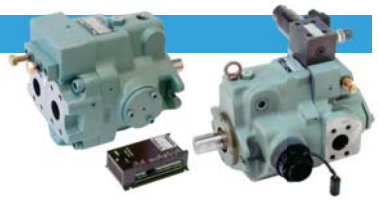
ARL1 Series Piston Pumps

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 cm^3 /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.
The size of the pump is more compact. 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.

A3HG Series Variable Displacement Piston Pumps

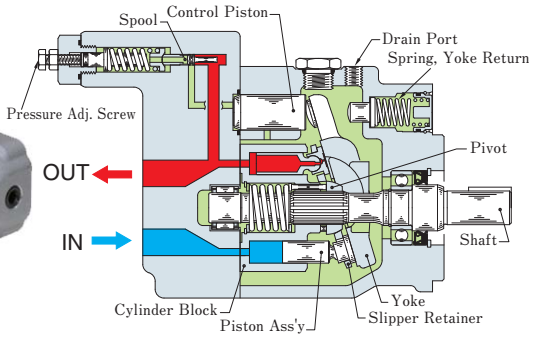
A3HG series pumps are high pressure variable displacement piston pumps based on our highly reputable "A3H" series pumps and meeting international standards (ISO and SAE). They have a rated pressure of 31.5 MPa and a maximum operating pressure of 35 MPa.
These pumps meet JIS standards as well as ISO standards common in Europe and SAE standards in North America to ensure interchangeability with pumps available on the global market.

A7H Series Variable Displacement Piston Pumps

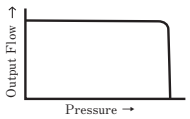
The A7H series variable displacement piston pumps offer a displacement of 180, 270 cm^3/rev with a rated pressure of 35 MPa and a maximum pressure of 40 MPa, supporting high pressure / high flow applications. The non-drive side of these pumps can be connected to an additional pump with SAE connection 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)
"ARL1" Series Piston Pumps		7	ARL1-6 / ARL1-8 / ARL1-12 / ARL1-16
"AR" Series Variable Displacement Piston Pumps		16	AR16 / AR22
"A" Series Variable Displacement Piston Pumps	Single Pumps	21	A10 / A16
		16	A22
		21	A37 / A45 / A56
		28	A70 / A90 / A100 / A145 / A220
	Double Pumps	28	A16 A22 A37 A56 / A16 A22 A37 A56 A70 A90 A145 (Inboard Pump (Driven End))
	Variable / Fixed Double Pumps	28	PV2R1 PV2R2 / A16 A22 A37 A56 A70 A90 A145 (Inboard Pump (Driven End))
"A3H" Series Variable Displacement Piston Pumps		35	A3H16 / A3H37 / A3H56 / A3H71 / A3H100 / A3H145 / A3H180
"A3HG" Series Variable Displacement Piston Pumps		35	A3HG16 / A3HG37 / A3HG56 / A3HG71 / A3HG100 / A3HG145 / A3HG180
"A7H" Series Variable Displacement Piston Pumps		40	A7H180 / A7H265

"ARL1" Series Piston Pumps



Control Type

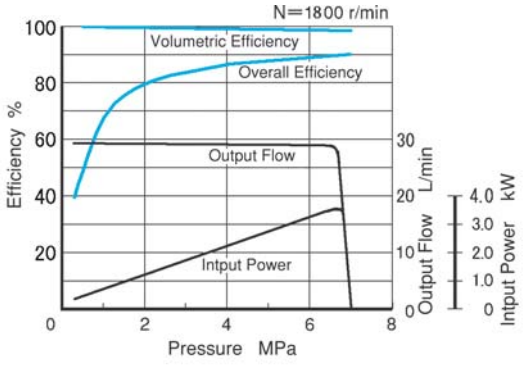
Control Type	Graphic Symbols
"01" Pressure Compensator Type	
	Performance Characteristics
	

Features

Compact size

The "ARL1" series piston pumps are designed to offer 44% reduction in weight and 50% reduction in capacity and significantly smaller in size and lighter in mass compared with the "AR" series piston pumps.

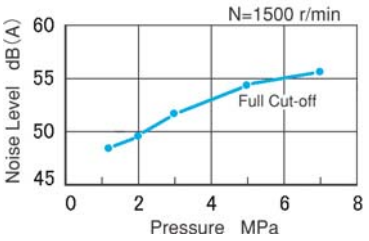
"**ARL1–16**" type performance characteristics



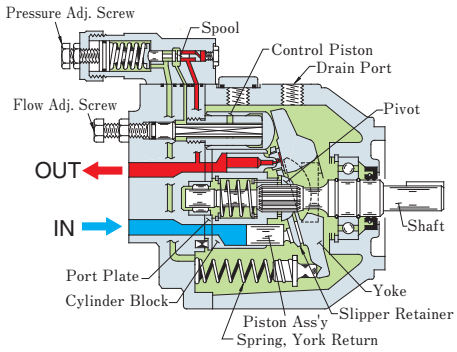
Low noise level

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.

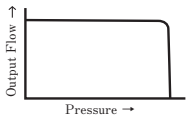
noise level characteristics



"AR" Series Variable Displacement Piston Pumps



Control Type

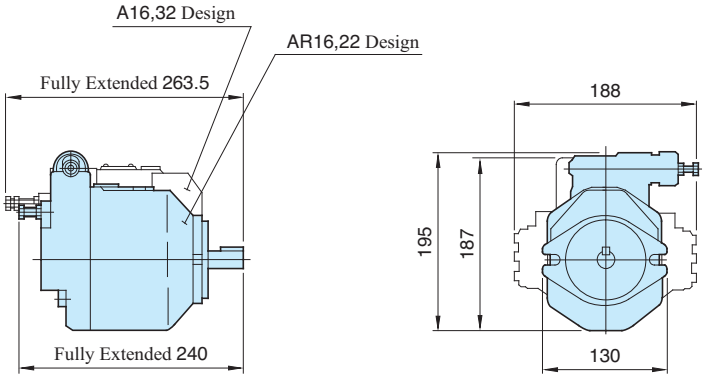
Control Type	Graphic Symbols
"01" Pressure Compensator Type	
	Performance Characteristics
	

Features

Smaller in Size

As indicated in the dimensional comparison presented below, the AR16 is smaller than the A16 (32 design).

[Comparison of "**AR16**" with "**A16**"]



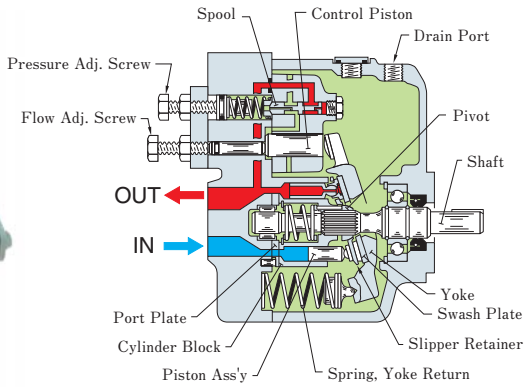
Low Noise

The noise level of AR16 has been reduced by 1-2 dB (A) at full flow and full cut-off compared with that of the excellent A16 quiet pump.

"A" Series Variable Displacement Piston Pumps

"01" Control Type

"04E" Control Type

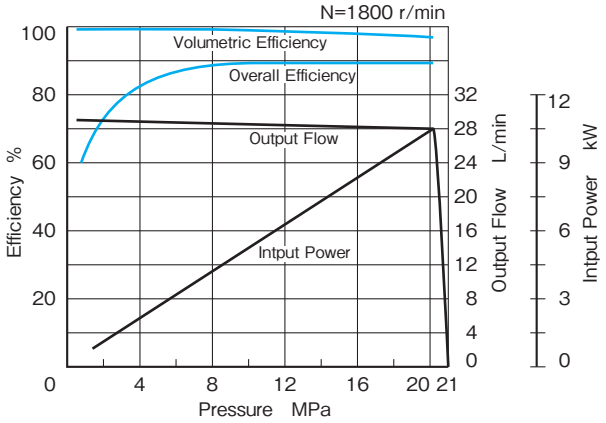


"01" Control Type

Features

High efficiency

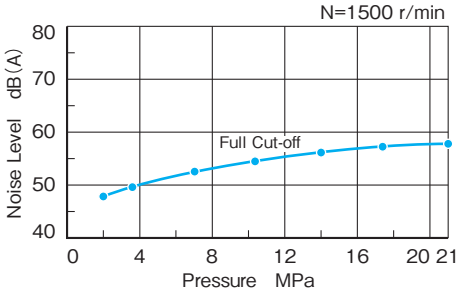
"A16" type performance characteristics



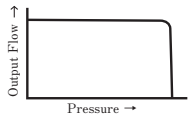
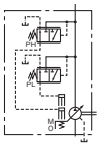
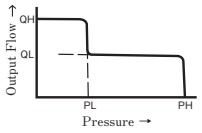
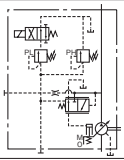
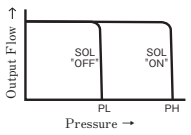
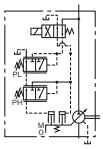
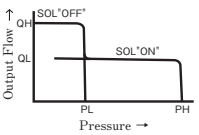
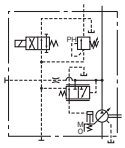
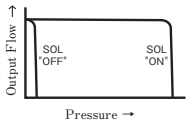
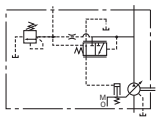
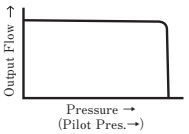
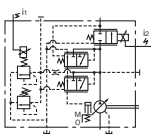
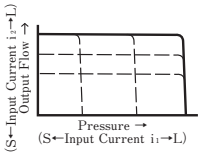
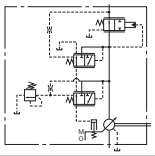
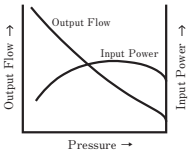
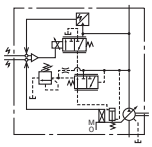
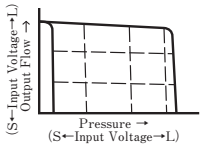
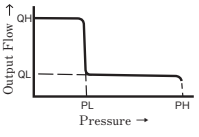
Low noise level

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.

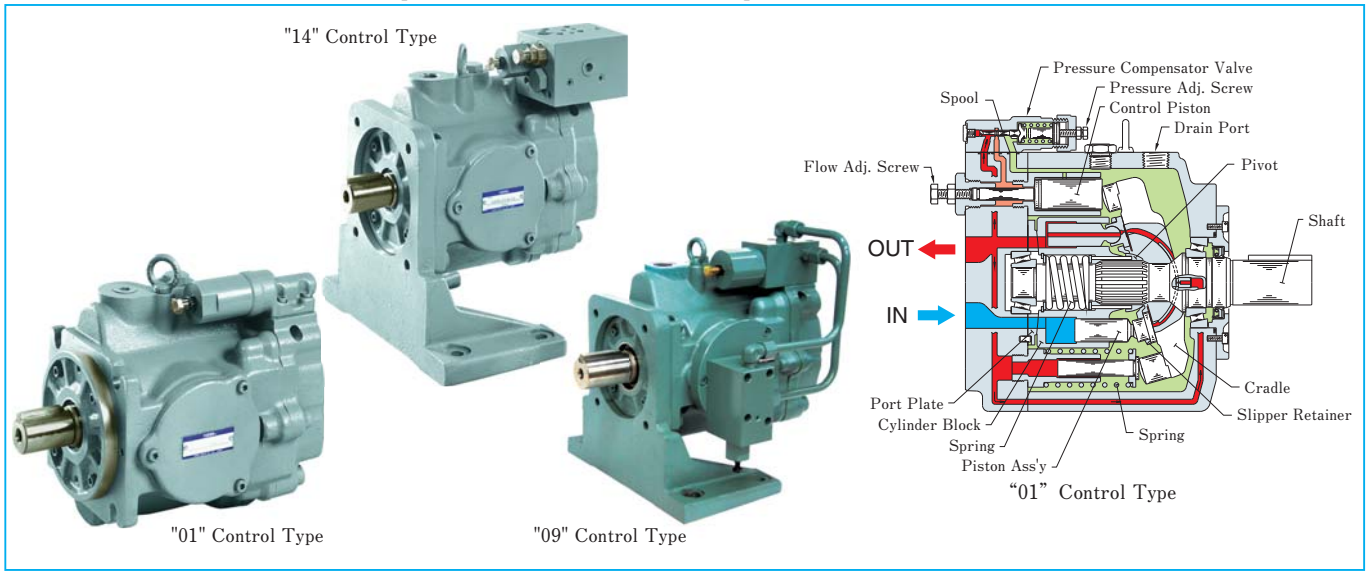
"A16" type noise level characteristics



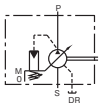
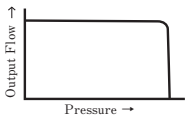
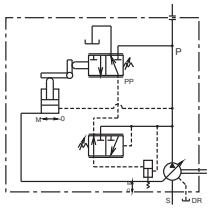
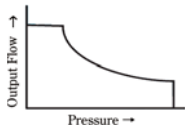
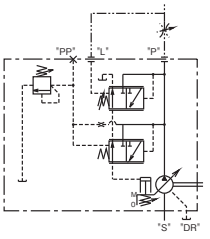
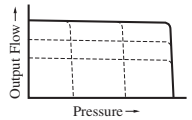
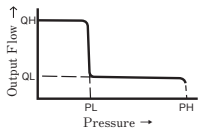
Control Type

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			"00-Z500" Simple Two-Pressure Two – Flow Control Type		
"04EH" Electro – Hydraulic Proportional Pressure & Flow Control Type (OBE Type)					

"A3H" Series Variable Displacement Piston Pumps



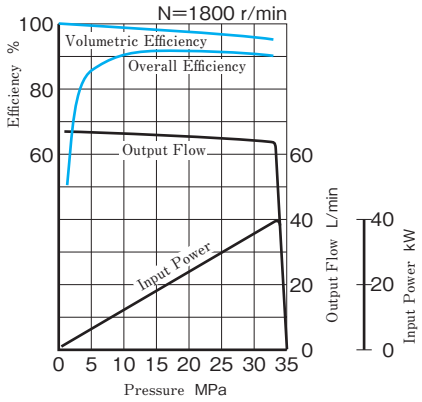
Control Type

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 efficiency

"A3H37" type performance characteristics.



Compact size

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

Specifications

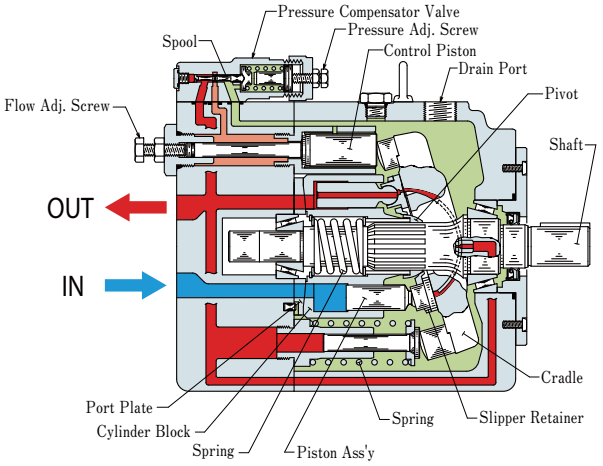
Model Numbers	Geometric Displacement cm^3 / rev	Minimum Adj. Flow cm^3 / rev	Operating Pres. MPa		Shaft Speed Range r/min		Mass kg (01 Control type)	
			Rated	Intermittent	Max.	Min.	Flange Mtg.	Foot Mtg.
A3H16—※R※KK(1)	16.3	8	28	35	3600	600	14.5	23.4
A3H37—※R※KK	37.1	16			2700	600	19.5	27.0
A3H56—※R※KK	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.

"A3HG" Series Variable Displacement Piston Pumps

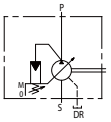
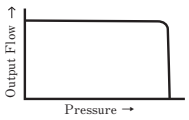
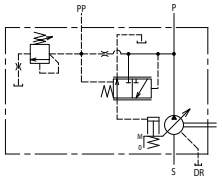
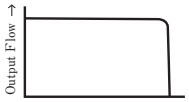
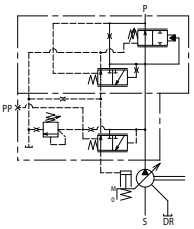
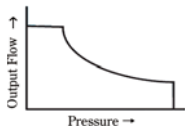
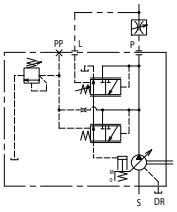
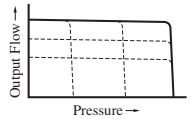
"01" Control Type

"09V" Control Type



"01" Control Type

Control Type

Control Type	Graphic Symbols	Performance Characteristics
"01" Pressure Compensator Type		
"07" Pilot Pressure Control Type Pressure Compensator		
"09V" Constant Power (Torque) Control Type With External Pilot		
"14" Load Sensing Type		

Features

Wide assortment of models to ensure interchangeability with pumps available on the global market

European models: Compatible with ISO 3019-2, North American models: Compatible with SAE J744 Standard models are available with keyed or splined shaft end.

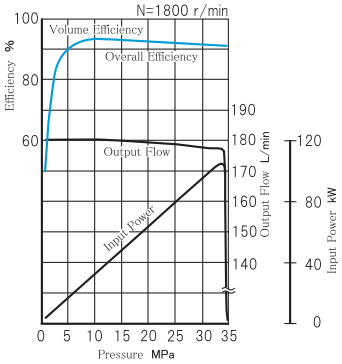
Wide displacement range and high volumetric efficiency

While inheriting the high performance of A3H series pumps, A3HG series pumps feature higher rated pressure design (31.5 MPa). They can be used as pumps capable of handling moderate to high loads in a wide range of applications.

Through drive supplied as standard

The through drive allows for multiple pump installation with a pump on the drive side and another pump with up to the same capacity as the other pump on the non-drive side. All pumps meeting international standards can be used on the non-drive side.

"**A3HG100**" type performance characteristics



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 Flange mounting)
			Rated	Intermittent	Max.	Min.	
A3HG16—※R※K※(1)	16.3	8	31.5	35	3600	600	17
A3HG37—※R※K※	37.1	16			2700	600	26.5
A3HG56—※R※K※	56.3	35			2500	600	32.5
A3HG71—※R※K※	70.7	45			2300	600	45
A3HG100—※R※K※	100.5	63			2100	600	56.5
A3HG145—※R※K※	145.2	95			1800	600	68.5
A3HG180—※R※K※	180.7	125			1800	600	88

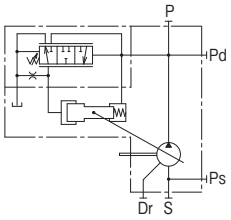
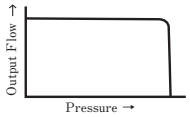
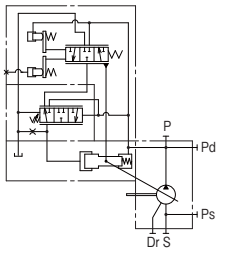
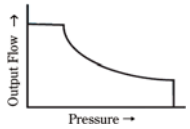
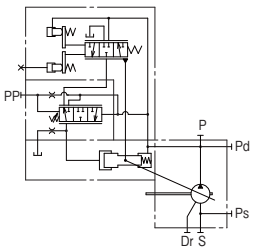
(1) The "A3HG16" model does not support the "09V" control type.

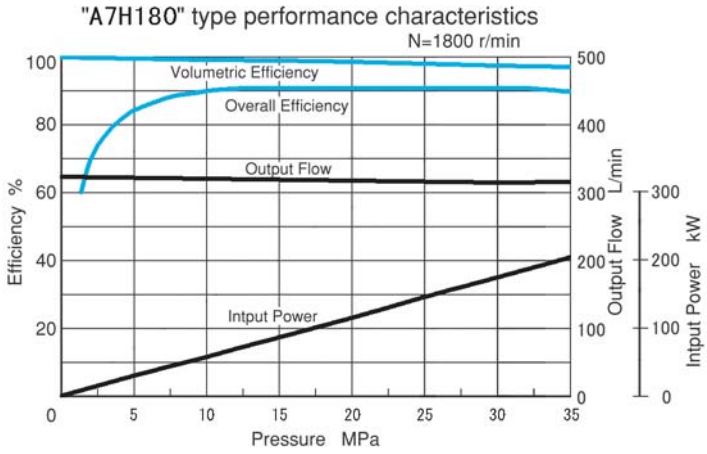
"A7H" Series Variable Displacement Piston Pumps

Features

- **High Pressure–Large Volume Displacement**
  Adding to current A3H series, 180, 270 cm^3/rev displacement with ratede pres. 35 MPa, Max. pres. 40 MPa pumps are now availavle.
- **Optional Through Drive**
  Optional through drive allow an auxiliary or outoboard pump (SAE Standard) to be directly mounted.
- **Fire–Resistant Fluids**
  Water–Glycols and Polyol Ester Type are applicable under certain condition.
- **High Efficiency**

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 ℃	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 ℃	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		

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 exellent 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.

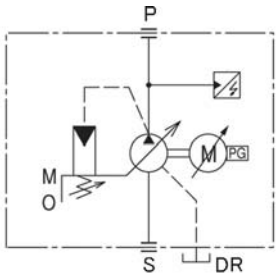
ASU Series AC Servo Motor Driven Pumps

There is "ASU Series AC Servo Driven Pumps", which is constructed in Gear pump and AC servo motor. For the details, please consult us.

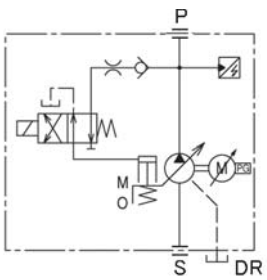
Specifications

Model	ASR1-C	ASR2-C	ASR3-E, G	ASR5-G, J	ASR10-J, M	ASE3	ASE5	ASE10	ASE10W	ASE15W
Max. Flow L/min	39.5	55.5	92.3	129	200	80.8	132.7	205.4	200	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	0.1
Motor Output kW	4.5	4.5	6 to 8	8 to 11	11 to 15	11	20	35	20	35
Mass (Pump + Motor) kg	54	54	80 to 89	94 to 177.5	213 to 233	75	123	190	173	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

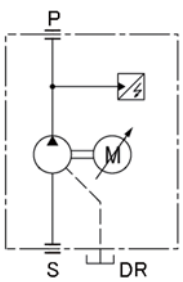
Graphic Symbols



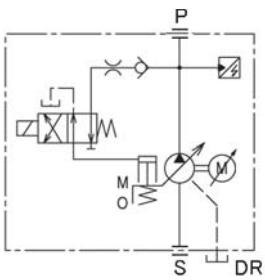
ASR
Single Displacement Type



ASR
Dual Displacement Type



ASE
Single Displacement Type



ASE10W&15W
Dual Displacement Type

"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 & contiuous pressure holding performance and excellent repeatability.

High response

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

Energy saving

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

→ Dual displacement models allow more compact system designs.

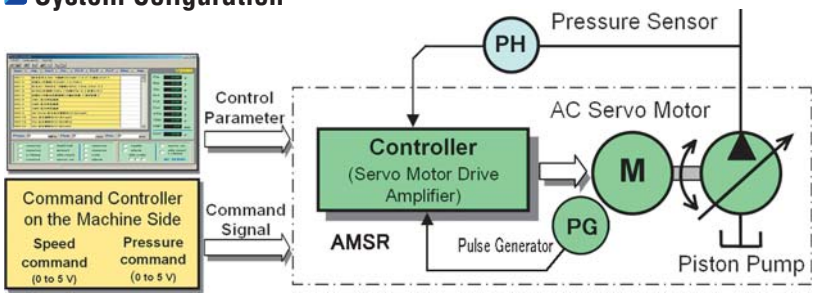
Less wiring

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

Large flow

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

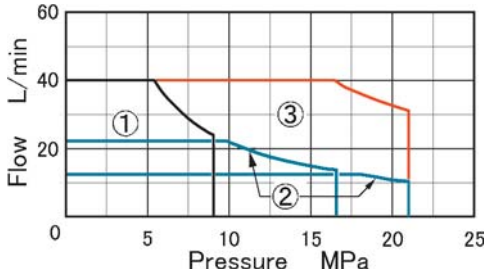
System Cofiguration



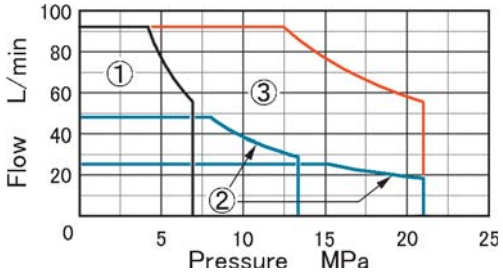
A feedback loop is by the AMSR controller that computes deviations between control signals from the machine side (speed and pressure commands) and sensor signals to drive the AC servo motor accordingly. Control parameters can be set digitally by using dedicated software.
The AC servo motor is selected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

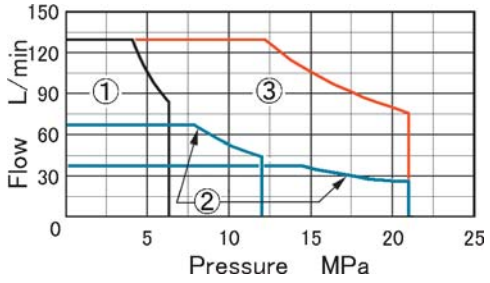
ASR1-C



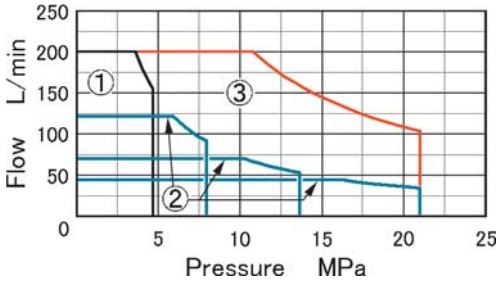
ASR3-G



ASR5-J



ASR10-M

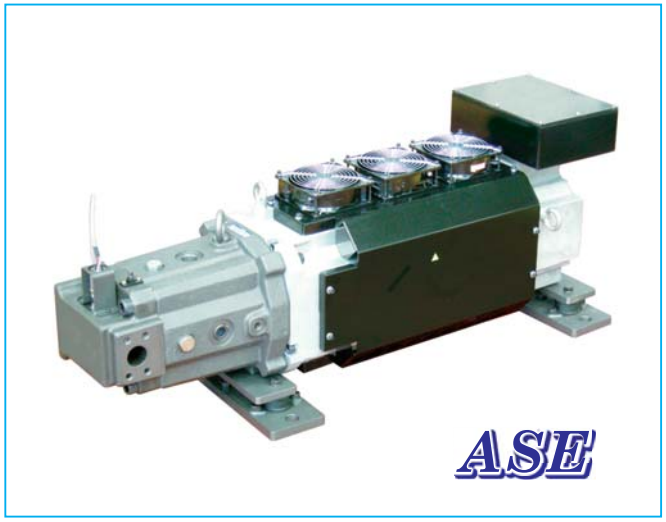


Model Number Designation

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 Connection for Solenoid Operated Directional Valve	Function Selection	Parameter Number	Design Number
ASR1	**None**: AC200V **4**: AC400V	**C**	**H**: 21 MPa	**X**: Single Displacement Type **W**: Dual 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							**12**
ASR3		**E, G**	**H**: 21 MPa							**11**
ASR5		**G, J**								**11**
ASR10		**J, M**			**A**: Horizontal **B**: Vertical					**12**

*1 Apply to only Flow Setting "W".

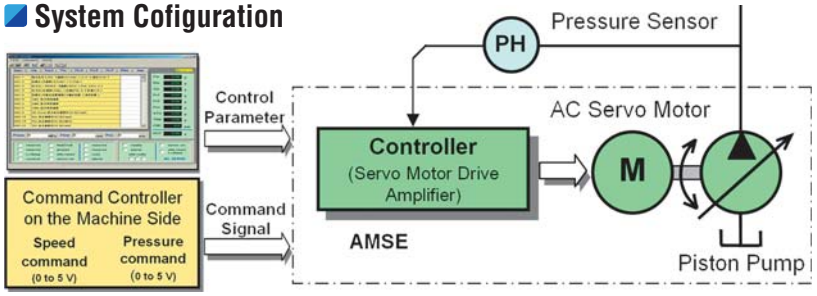
"ASE" Series AC Servo Motor Driven Pumps



Features

- **Low noise**
  Noise reduction insulation included as standard.
- **Less wiring/high reliability**
  Uses sensor-less rotational speed control.
- **Space saving/compactness**
  Integrated motor pump unit.
- **Larger motor output**
  (comparde 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 Cofiguration

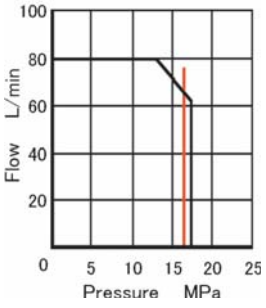


A feedback loop is by the AMSE controller that computes deviations between control signals from the machine side (speed and pressure commands) and sensor signals to drive the AC servo motor accordingly. Control parameters can be set digitally by using dedicated software.
The AC servo motor is selected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

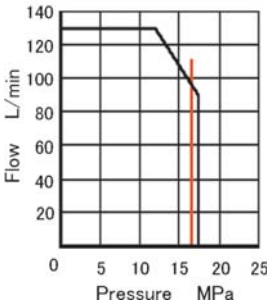
Sample of Pressure–Flow Diagram

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

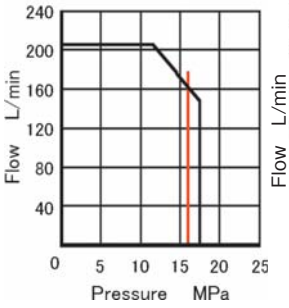
● ASE3-※AA-G80



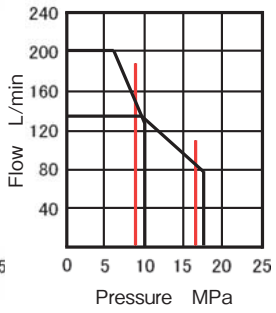
● ASE5-※BZ-G130



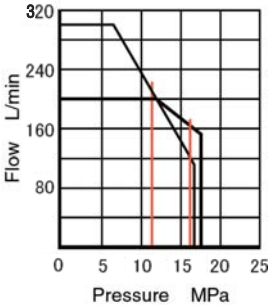
● ASE10-※CE-G200



● ASE10W-※BZ-G100/58



● ASE15W-4CE-G151/100



Model Number Designation

ASE3	–4	AA	–G	80	S	A100*2	N*2	–A	00	–40
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	Parmeter Number	Design Number
ASE3	**None**: AC200V **4**: AC400V	**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	**None**: Terminal Box **N**: Plug-in Connector (Optional)	**A**: Single **B**: Combination (Single Use Allowed)	**00**: Standard	**40**
ASE5		**BZ**		**130**: 132.7 L/min*1						**40**
ASE10		**CE**		**200**: 205.4 L/min*1						**30**
ASE10W		**BZ**		**W**: User Setting **100/58**: Large Flow (Sol OFF) 100 cm^3/rev Small Flow (Sol ON) 58 cm^3/rev						**20**
ASE15W	**4**: AC400V	**CE**		**W**: User Setting **151/100**: Large Flow (Sol OFF) 151 cm^3/rev Small Flow (Sol ON) 100 cm^3/rev		**AC (AC → DC)** **R100**: AC100V **R200**: AC200V		**B**: Combination (Single Use Allowed)		**20**

*1 In case of Max. Operating Revolution.
*2 Apply to only Series Numbers "**ASE10W** & **ASE15W**".

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 237cm^3/rev.

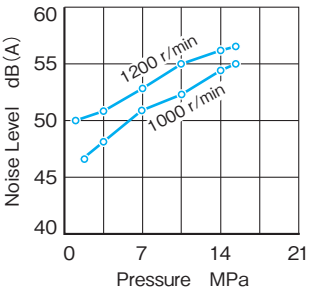
●Model ·····PV2R1, PV2R2, PV2R3, PV2R4 and Double Pumps.
●Max.Operating Pressure ·····21MPa
●Geometric Displacement ·····PV2R1 : 5.8～31/PV2R2 : 41.3～64.7
PV2R3 : 76.4～115.6/PV2R4 : 136～237cm^3/rev

Noise Level

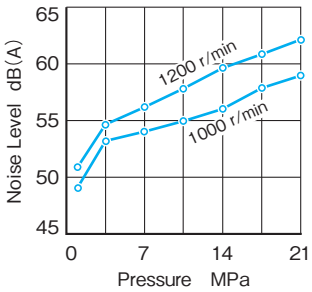
●Measuring condition

Fluid viscosity : 20mm^2/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 cm^3/rev

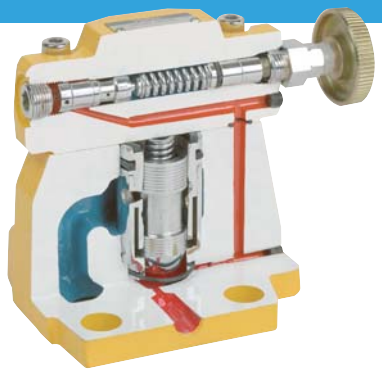
Pump Type	Maximum Operating Pressure MPa	Output Flow L/min at 1200 r/min at No-Load (1 2 5 10 20 50 100 200 500 800)
Single Pumps	7	50T 150T
"PV2R" Series Single Pumps	21	PV2R1 PV2R2 PV2R3 PV2R4
"PV2R" Series Double Pumps	21	Small Volume: PV2R1 PV2R2 PV2R3 / Large Volume: PV2R2 PV2R3 PV2R4
"PV2R4A" Series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

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.

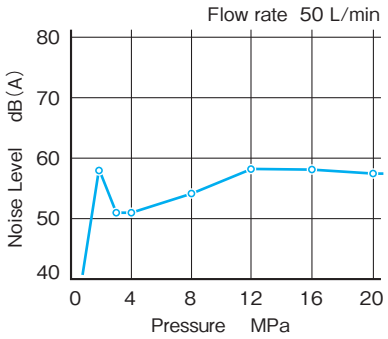


Noise Level

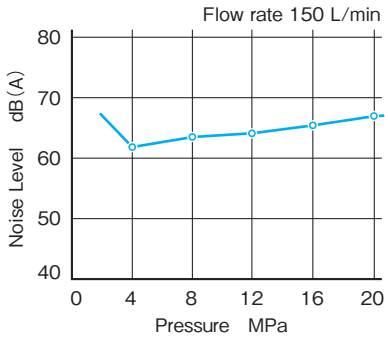
●Measuring condition

Fluid viscosity : 35mm^2/s
Measuring position : At one metre back from the valve front.
Tank line back pressure : 0.1MPa

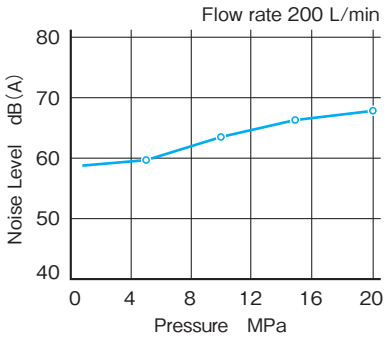
S-BG-03



S-BG-06



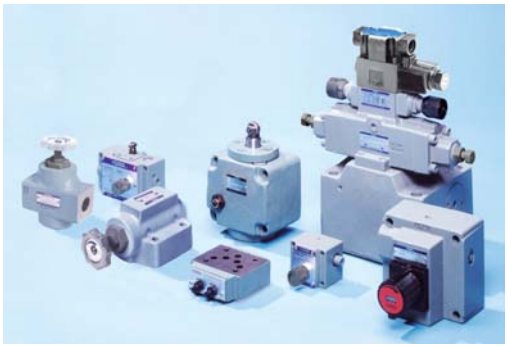
S-BG-10



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
High Pressure Type Relief Valves	35	B3G 03 06
Solenoid Controlled Relief Valves	25	BST/BSG 03 06 10 16
Low Noise Type Sol. Cont. Relief Valves	25	S-BSG 03 06 10
High Pressure Type Sol. Cont. Relief Valves	35	B3SG 03 06
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	BUCG 03 06 10
Pressure Switches	35	———

Flow Control Valves

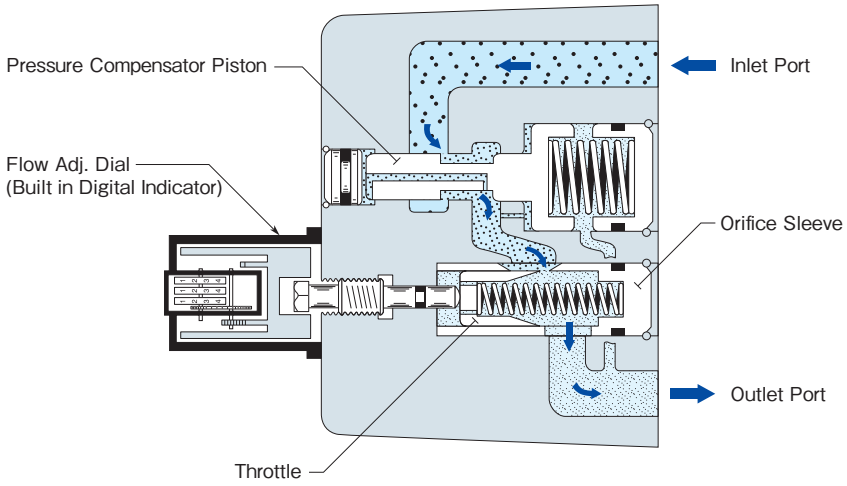
These valves control the reciprocating and rotating speed of hydraulic actuators, A variety of flow control valves including pressure and/or temperature-compensated flow control valves are available.



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.

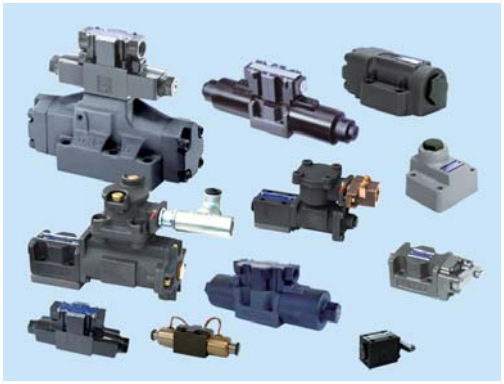
Flow Control Valves



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
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	ZT·ZG/ZCT·ZCG 03 06 10
Feed Control Valves	14	UCF1G/UCF2G 01 03 04
Needle Valves	35	GCT GCTR −02

Directional Control Valves

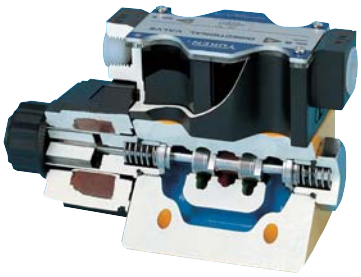
These valves control the flow direction in the hydraulic circuit. The various directional valves ranging from the solenoid operated directional valves to the check valves which comform to JFPS Standard (The Japan Fluid Power Standard) are available to meet the variety in customers' needs.



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)
Energy-Saving Solenoid Operated Directional Valves	35	HE-DSG-01
Explosion Proof (Frameproof) Type Solenoid Operated Directional Valves	35	DSG-01-※※※-※X※
	31.5	DSG-03-※※※-※X※
Explosion Proof (Increased Safety) Type Solenoid Operated Directional Valves	31.5	DSG-01-※※※-※Y※ DSG-03-※※※-※Y※
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	DSLG-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) / Sub-plate mounting (CP※G) 03 06 10 (Rated Flow) Flanged connection (CP※F) 10 16 (Rated Flow)

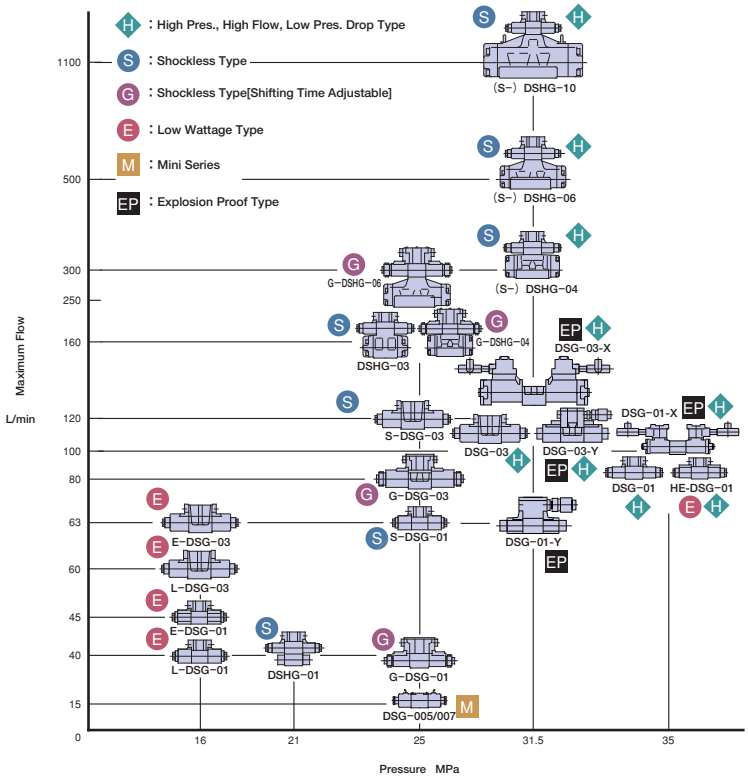
Solenoid Operated Directional Valves / Solenoid Controlled Pilot Operated Directional Valves

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

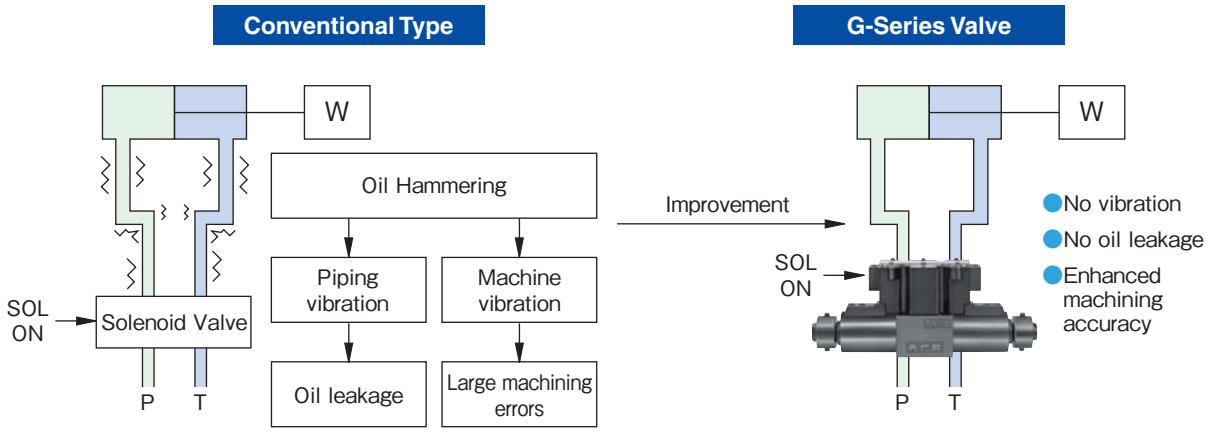
- Model ····· AMN−G
- Power Supply ····· DC 24V (20～30V)
- Max. Input Power····· 35W

G Series Shockless Type Solenoid Operated Directional Valves

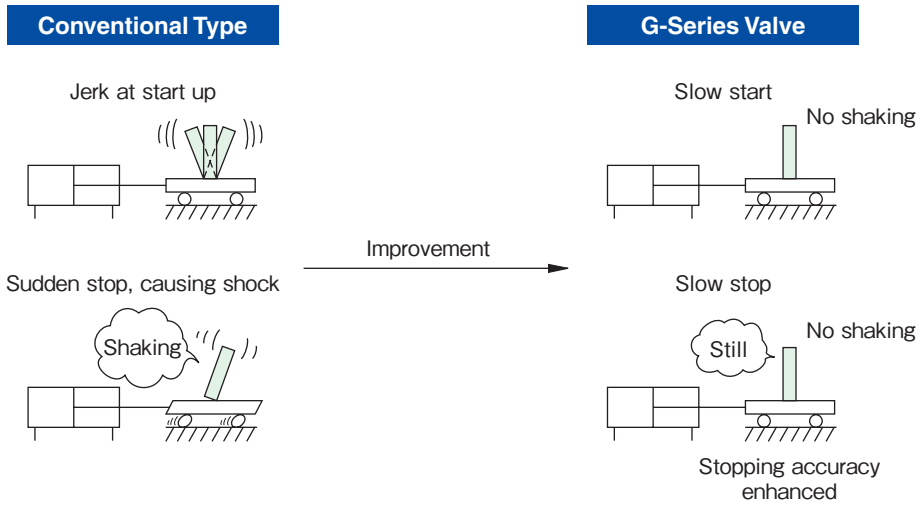
The G series solenoid operated directional valve reduces any shocks that may arise when starting machinery or shifting the spool.
These valves feature less pipe leakage and offer more accurate control and improve the reliability of the machinery on which they are used.

●Your valuable machines are protected from vibration and shocks

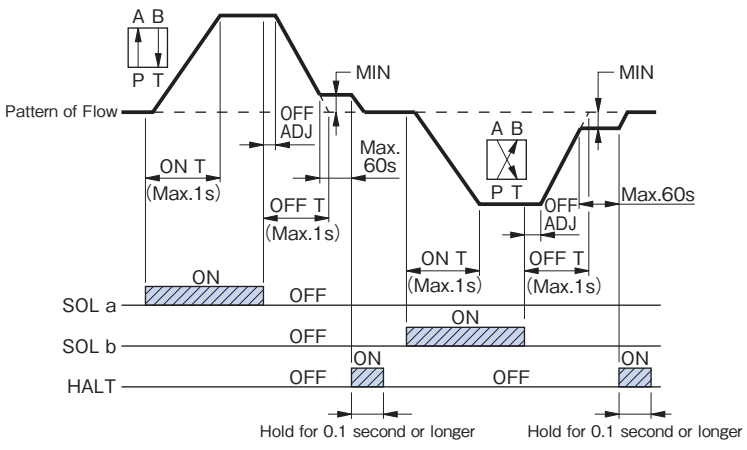
■ Shocks caused by acceleration and deceleration are reduced.



■ Oil hammering during spool shifting is reduced.

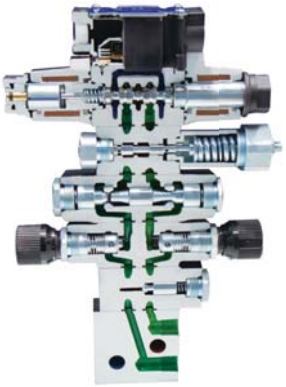


■ Relationships between SOL signals and flow patterns



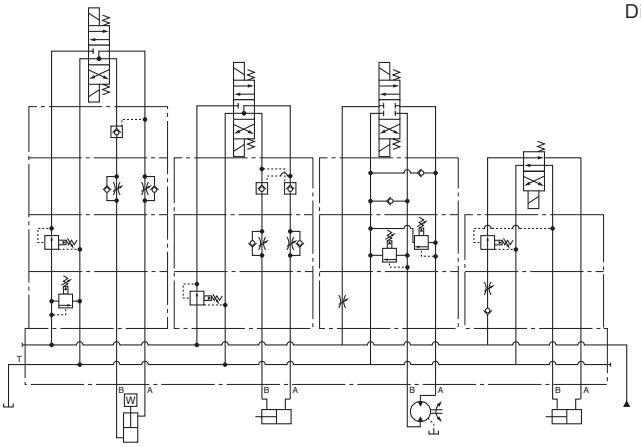
Modular Valves

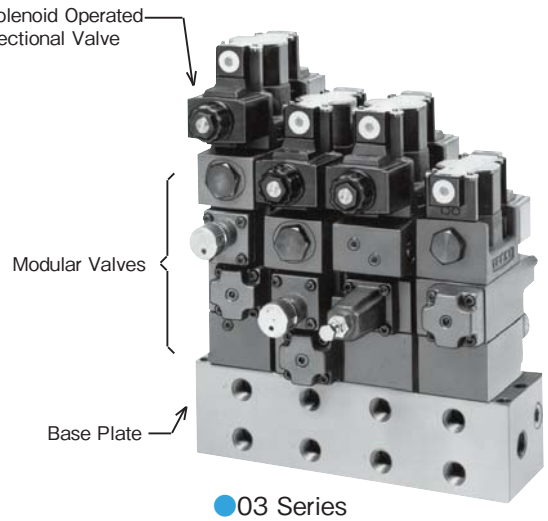
YUKEN MODULAR VALVES are designed to simplify hydraulic systems, to eliminate the use of pipe connections and to save space, time and costs. The modular valves have standardized interfaces (ISO 4401, CETOP, NFPA) and thickness in accordance with each valve size. Any hydraulic circuit can be created by 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





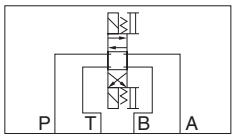
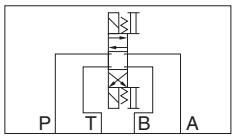
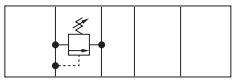
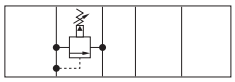
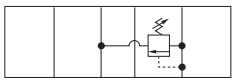
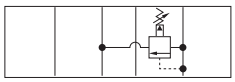
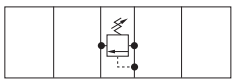
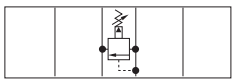
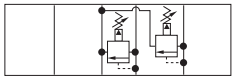
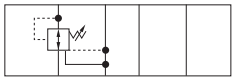
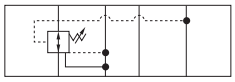
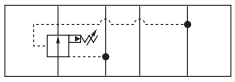
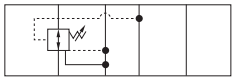
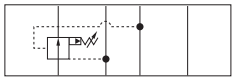
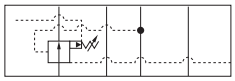
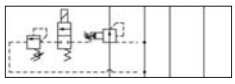
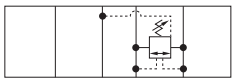
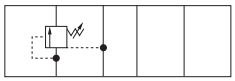
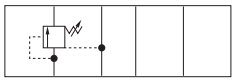
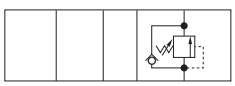
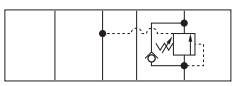
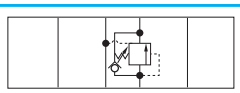
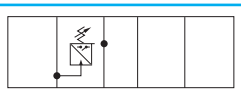
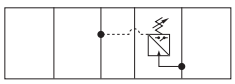
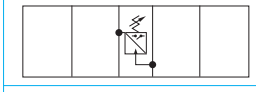
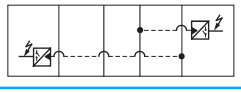
03 Series

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	35	
10 Series Modular Valves	25	

★Max Flow for Throttle and Check Modular Valves.

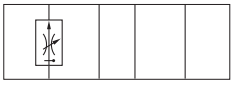
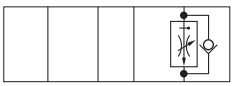
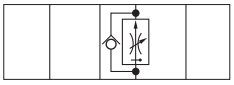
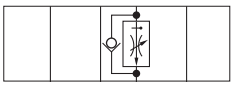
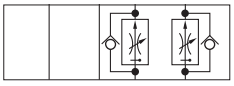
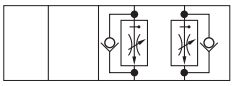
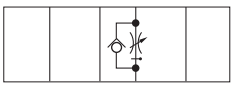
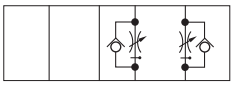
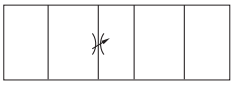
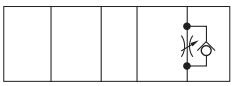
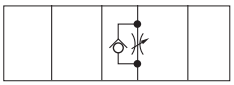
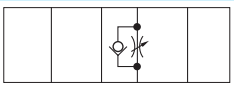
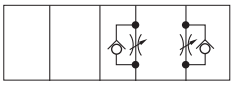
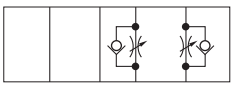
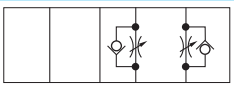
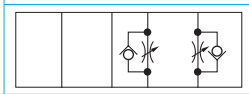
List of 005/007/01/03 Series Modular Valves (Pressure Controls)

●Pressure Controls

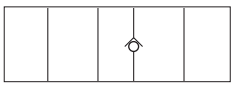
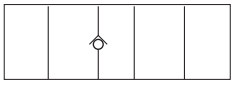
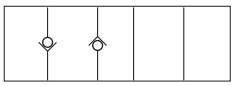
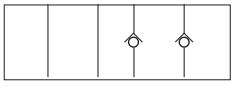
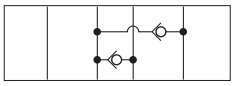
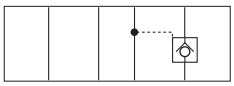
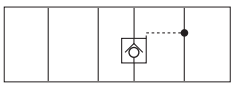
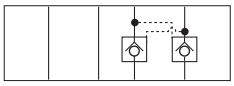
Name	Graphic Symbols	Model Numbers "005/007/01" Series	Graphic Symbols	Model Numbers "03" Series
Solenoid Operated Directional Valves		DSG−005 DSG−007 DSG−01		DSG−03
Relief Modular Valves		MBP−005		MBP−03
		MBP−01 MBA−01		MBA−03
		MBB−01		MBB−03
	——			MBW−03
Reducing Modular Valves		MRP−005 MRP−007 MRP−01		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 Tow 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		
		MJW−01−J		

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

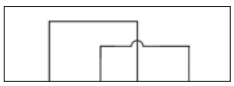
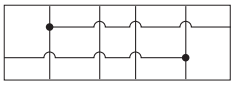
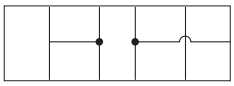
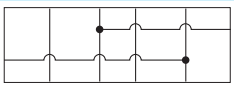
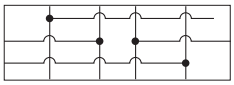
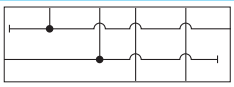
●Flow Controls

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
		MST−01
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

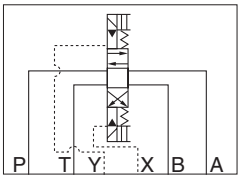
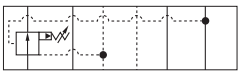
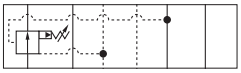
Name	Graphic Symbols (P T B A)	Model Numbers
Check Modular Valves		MCP−005 MCP−01 MCP−03
		MCA−01 MCA−03
		MCB−01 MCB−03
		MCT−01 MCT−03
		MCPT−03
		MCW−01 MCW−03
Anti−Cavitation Modular Valves		MAC−01 MAC−03
Pilot Operated Check Modular Valves		MPA−01 MPA−007 MPA−007
		MPB−005 MPB−007 MPB−01 MPB−03
		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)

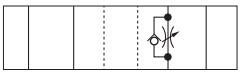
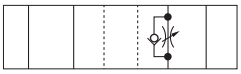
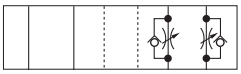
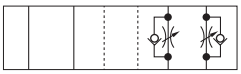
●Pressure Controls

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

005 Series
MSW-005

007 Series
MRP-007

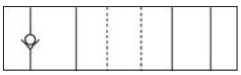
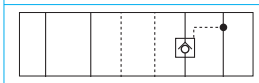
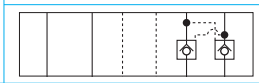
●Flow Controls

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
Bolt Kits	———	MBK − 04 MBK − 06 MBK − 10

04 Series
MRP-04

06 Series
MSW-06

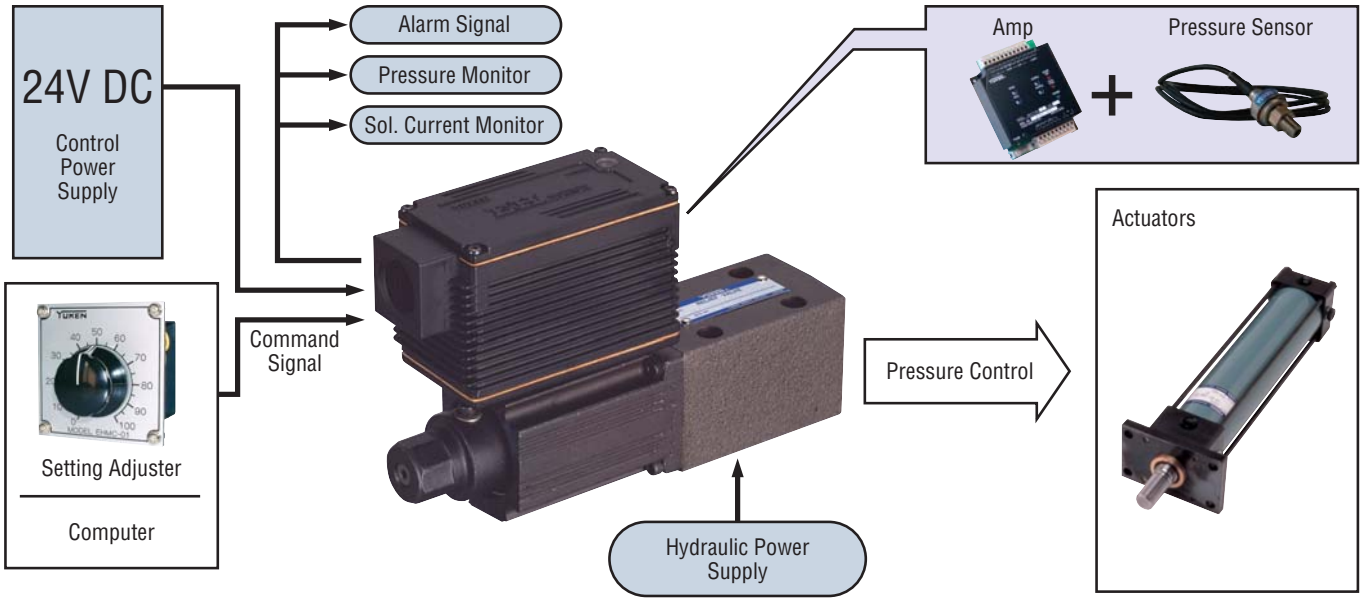
10 Series
MSW-10

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.



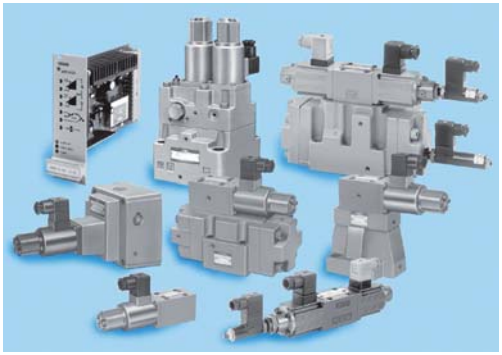
Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min (1 2 3 5 10 20 30 50 100 200 300 500 1000)
Pilot Relief Valves	24.5	EHDG-01
Pressure Control Valves	SB1110 : 24.5 SB1190 : 7.0	SB1110 SB1190
Relief Valves	24.5	EHBG 03 06 10
Reducing & Relieving Valves	24.5	EHRBG 06 10
Flow Control (& Check) Valves	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
Direct Operated & High Response Type Directional & Flow Cont. Valve	35	ELDFG 01EH 03EH
Two Stage & High Response Type Directional & Flow Cont. Valve	03, 04, 10 : 35 06 : 31.5/35	ELDFHG 03EH 04EH 06EH 10EH

Note) Setting adjusters are also available.

E 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 (40Ω Series) 02 03 06 10
	24.5	EFG/EFCG (10Ω Series) 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-※-41	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 Feeback	AMN-L-01-※-※-10	High Response Type Directional and Flow Control
	AMB-EL-※-※-※-※-20	
Shockless	AMN-G-10	Shockless Directional and Flow Control

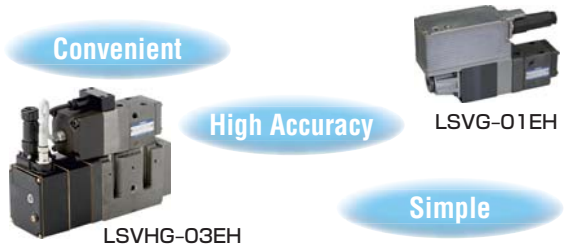
Linear Servo Valves

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.

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.

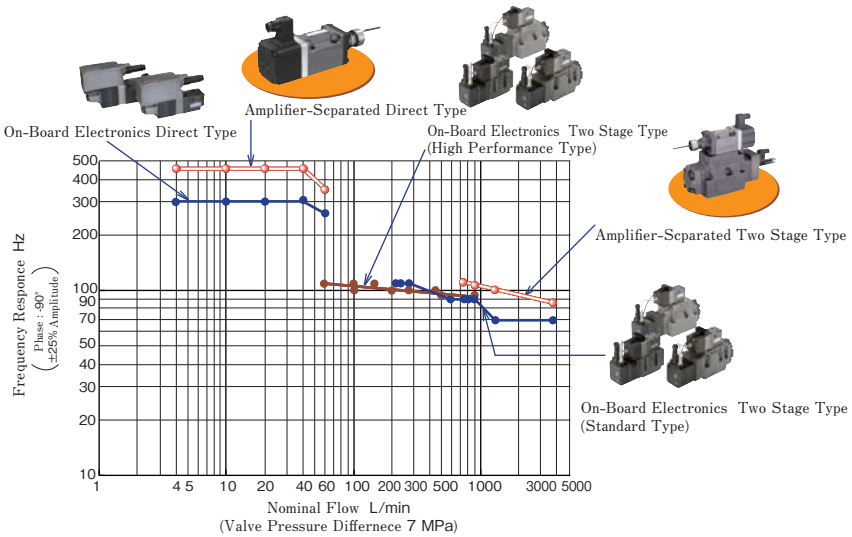


Specifications

Valve Type		Max. Operating Press. MPa	Nominal Flow L/min (Valve Pressure Differnece 7 MPa)	Frequency Responce ±25% Amplitude 90° Phase Hz	Step Responce 0→100% ms	Spool Type
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 210 230 270	110	7,8	2:10% Overlap, 2L:2% Overlap (Lenear Flow Gain), 2P:Zero lap (Dual Flow Gain), 40:A,B,T Connection, 4J:A,B,T Connection (Neutral) or ★1
		35	LSVHG-04EH 580 750	90	11	
		820,900:35 1300:31.5	LSVHG-06EH 820 900 1300	90, 70	11,15	
		35	LSVHG-10EH 900 3800	70	18	
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	

★1. There is no spool type "4J" in LSVHG-10EH.

Frequency Responce Chart



Winning The 2010 JSME* Excellent Product Award

* The Japan Society of Mechanical Engineers

High-speed Linear Servo Valves/Servo Amplifiers

Linear Servo Valves 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.

Two Stage Type — LSVHG-06

●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 serve valves can accept the contamination level of up to class 10.

Linear Servo Amplifiers — AMLS

Direct Type — LSVG-03

On-board Electronics Type Linear Servo Valves

Introducing new high flow type models (LSVHG–10EH 3800 L/min): 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.

Color	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

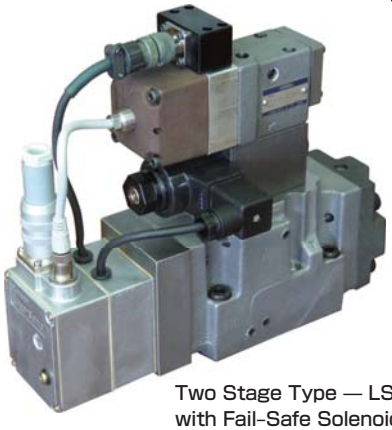
Simple

Highly accurate hydraulic control can be obtained only by supplying 24 V DC power and inputting a command signal voltage of 0 to ±10V, 0 to ±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.

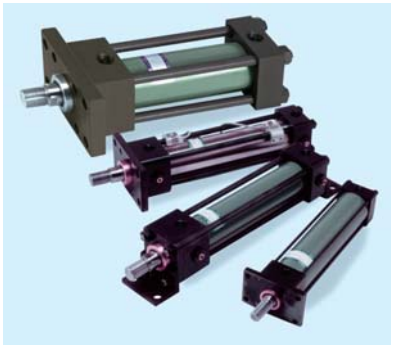
Direct Type — LSVG-01EH



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

Hydraulic Cylinders

The actuators convert hydraulic energy to mechanical energy.



"CJT" Series Hydraulic Cylinders

"CJT" Series Hydraulic Cylinders are provided with many mounting types so that they can be used for wide use of general purpose industrial machines such as machine tools.
Moreover, Switch-Set "CJT" Series Hydraulic Cylinders with a proximity switch which facilitates detecting a position with a slide proximity switch on the cylinder body is also available.

- **Various mounting types.**
- **Excellent ability in low speed and high-precision operation.**
- **Gentle stop characteristics obtained with a smooth cushion effect.**

Description		Standard Type				Compact Type	Switch Set Type			
		CJT35	CJT70	CJT140	CJT210	CJT210C	CJT35L	CJT70L	CJT140L	CJT210CL
Cylinder Bore	mm	Refer to the "Cylinder Bore Selection Chart"								
Nominal Pressure	MPa	3.5	7	14	21		3.5	7	14	21
Min. Operating Pressure	MPa	Less than 0.1	Less than 0.3	Less than 0.3	Less than 0.3	Less than 0.3	Less than 0.1	Less than 0.3	Less than 0.3	Less than 0.3
Operating Speed	mm/s	8 - 300	8 - 400 ★1		8 - 300	8 - 400 ★1	8 - 300	8 - 400 ★1		8 - 300
Max. Stroke ★2	mm	1800	2000				1600	2000		

★1. Max. Operating Speed is varied according to the Cylinder Bore.

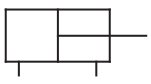
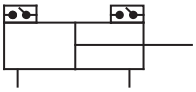
★2. Max. Stroke may be varied according to the Cylinder Bore. It also may be limited to lower value according to buckling strength. For details, consult Yuken.

● Cylinder Bore Selection Chart

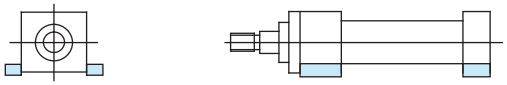
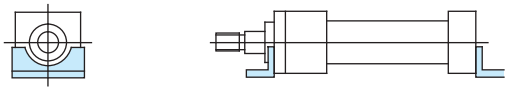
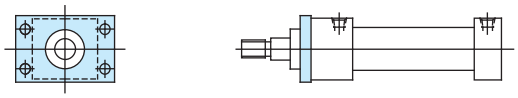
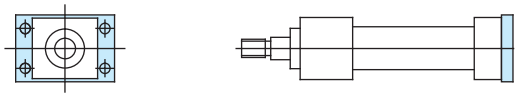
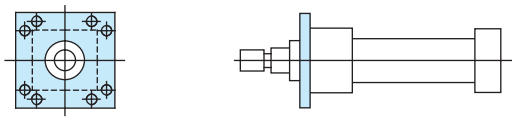
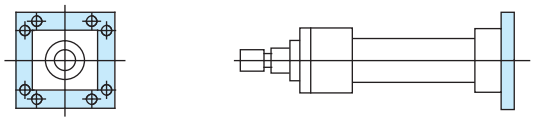
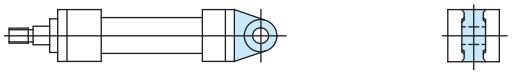
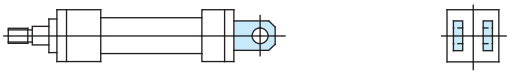
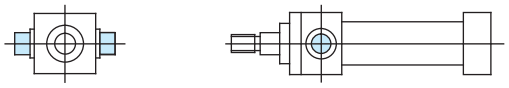
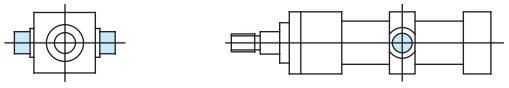
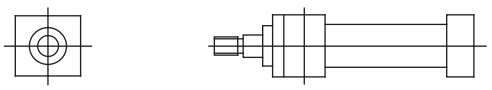
Cylinder Bore mm	Standard Type				Compact Type	Switch Set Type			
	CJT 35	CJT 70	CJT 140	CJT 210	CJT 210C	CJT 35L	CJT 70L	CJT 140L	CJT 210CL
32	○	○	○			○	○	○	
40	○	○	○	○	○	○	○	○	○
50	○	○	○	○	○	○	○	○	○
63	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○
100	○	○	○	○	○		○	○	
125	○	○	○	○	○		○	○	
140		○	○	○	○				
150		○	○						
160	○	○	○	○	○				
180		○	○						
200		○	○						
220		○	○						
250		○	○						

★The mark ○ in above chart show selectable Cylinder Bore.

Hydraulic Cylinders

Cylinder Type		Nominal Pressure MPa	Cylinder Bore mm
Standard Type 	CJT 35	3.5	32 - 160
	CJT 70	7	32 - 250
	CJT 140	14	32 - 250
	CJT 210 CJT 210C	21	40 - 160
Switch Set Type 	CJT 35L	3.5	32 - 80
	CJT 70L	7	32 - 125
	CJT 140L	14	32 - 125
	CJT 210CL	21	40 - 80

Mounting Typrs of "CJT" Cylinders

Symbol	Name	Illustration of Mounting Type	CJT35 CJT35L	CJT70 CJT70L	CJT140 CJT140L	CJT210 CJT210CL
LA	Foot Mounting Side Lugs		○	○	○	○
LB	Foot Mounting Side End Angles		○	○	○	
FA	Rod Rectangular Flange		○	○		○
FE				○	○	
FY				○	○	
FB	Head Rectangular Flange		○	○		○
FF				○	○	
FC	Rod Square Flange			○	○	
FD	Head Square Flange			○	○	
CA	Cap Detachable Eye		○	○	○	○
CB	Cap Detachable Clevis		○	○	○	
TA	Rod Trunnion		○	○	○	
TC	Intermediate Trunnion		○	○	○	○
SD	Basic Type		○	○	○	○

● The mark ○ in above chart show selectable Mounting Types.

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

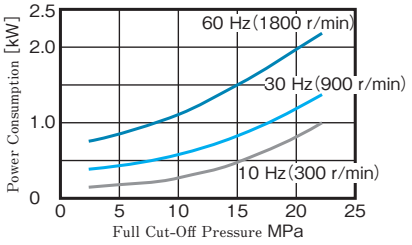
●Rotational frequency control is effective for reducing power loss.

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

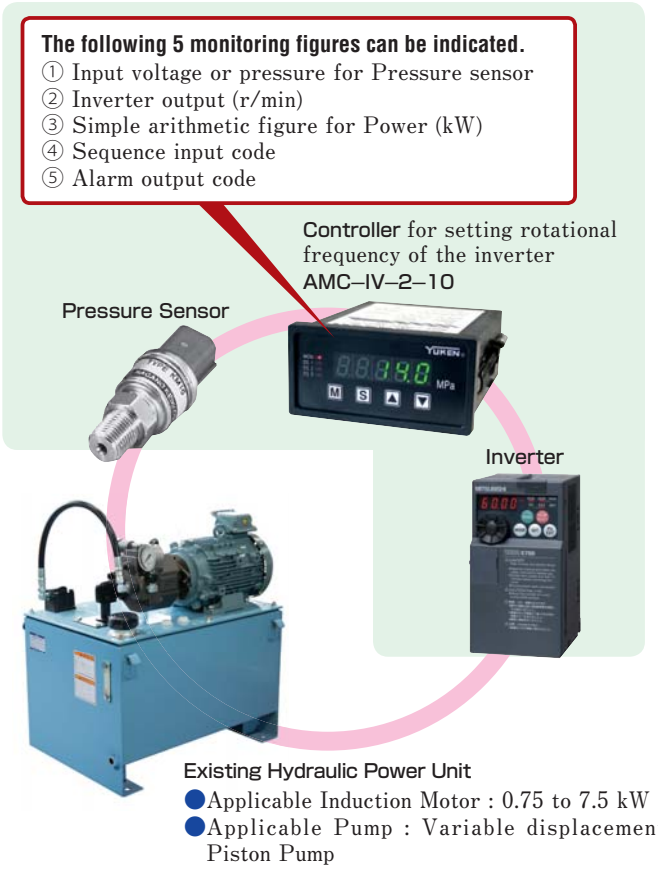


Energy-saving control system for hydraulic units (Energy saving controller)

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.

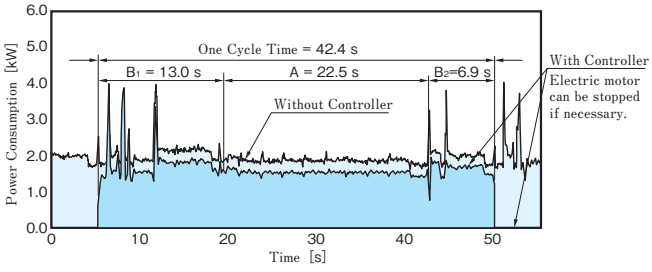
System Configuration

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



- 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%
$B_1 + B_2$	Actual Work	2.01 kW	1.69 kW	Approx. 16%

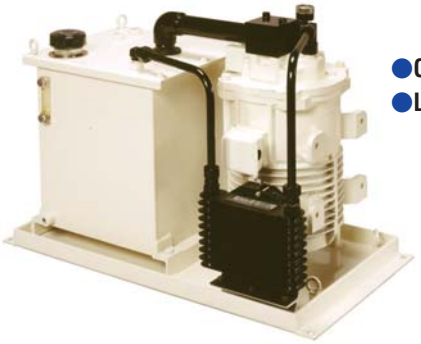
Specifications

- 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 ℃

★Also available with on simple model that is easy set up. For details, please ask Yuken

Standard Hydraulic Power Units

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



- **Compact and lightweight**
- **Low noise level**

YP Pack

YA Pack

- **Wide assortment of models**
  A total of 35 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 configutation of the control circuit**
  With 21 different options (incorporating a base plate, etc.), a wide variety of control circuits can be easily configured.

- **Greatly reducing power consumption**
- **Low noise**
- **Low heat generation**

YA-e Pack

Hydraulic Power Unit Type	Model Numbers	Max.Operating Pressure MPa	Reservoir Capacity L (1 2 5 10 20 50 100 200)	Geometric Displacement cm^3/rev (1 2 5 10 20 50)	Electric Motor kW×4P
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				0.75/1.5/2.2/3.7/5.5/7.5
	YA22				2.2/3.7/5.5/7.5
	YA37	7			3.7/5.5/7.5
Energy-Saving Hydraulic Power Unit YA-e Pack	E-YA10	7/16			2.2/3.7
	E-YA16				0.75/1.5/2.2/3.7/5.5/7.5
	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	—	—	—	—

Worldwide YUKEN Affiliated Companies and Distributors

■Affiliated Company ●Distributor ◆Service Center

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Fax. +54-11-4754-9093
URL http://www.distritec.com.ar

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●**ACT Corporation (AUSTRALIA) Pty. LTD.**
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Fax. +61-7-3841-4088
URL http://www.actcorp.com.au

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●**Eurofluid Hydraulik GmbH.,**
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Fax. +43-2272-66991
URL http://www.eurofluid.at

BELGIUM

●**Vameco B.V.B.A.**
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8600 ,BELGIUM
Tel. +32-150-0117
Fax. +32-150-4117
URL http://www.vameco.be

BRAZIL

●**Hidracomp Componentes Hidraulicos Ltda.**
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Nova York, CEP 03480-000 Sao Paulo -SP ,BRAZIL
Tel. +55-11-2721-1113
Fax. +55-11-2721-9302
URL http://www.hidracomp.com.br

●**KBK do Brazil Comercio de Maquinas Ltda.**
Rua da Consolacao, 1992-3 andar, Conj.32,
Edificio Royal Park, CEP:01302-001
-Consolacao- Sao Paulo -SP- ,BRAZIL
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Service Center in China

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●**HY INDUSTRY (HANGZHOU) CO., LTD**
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