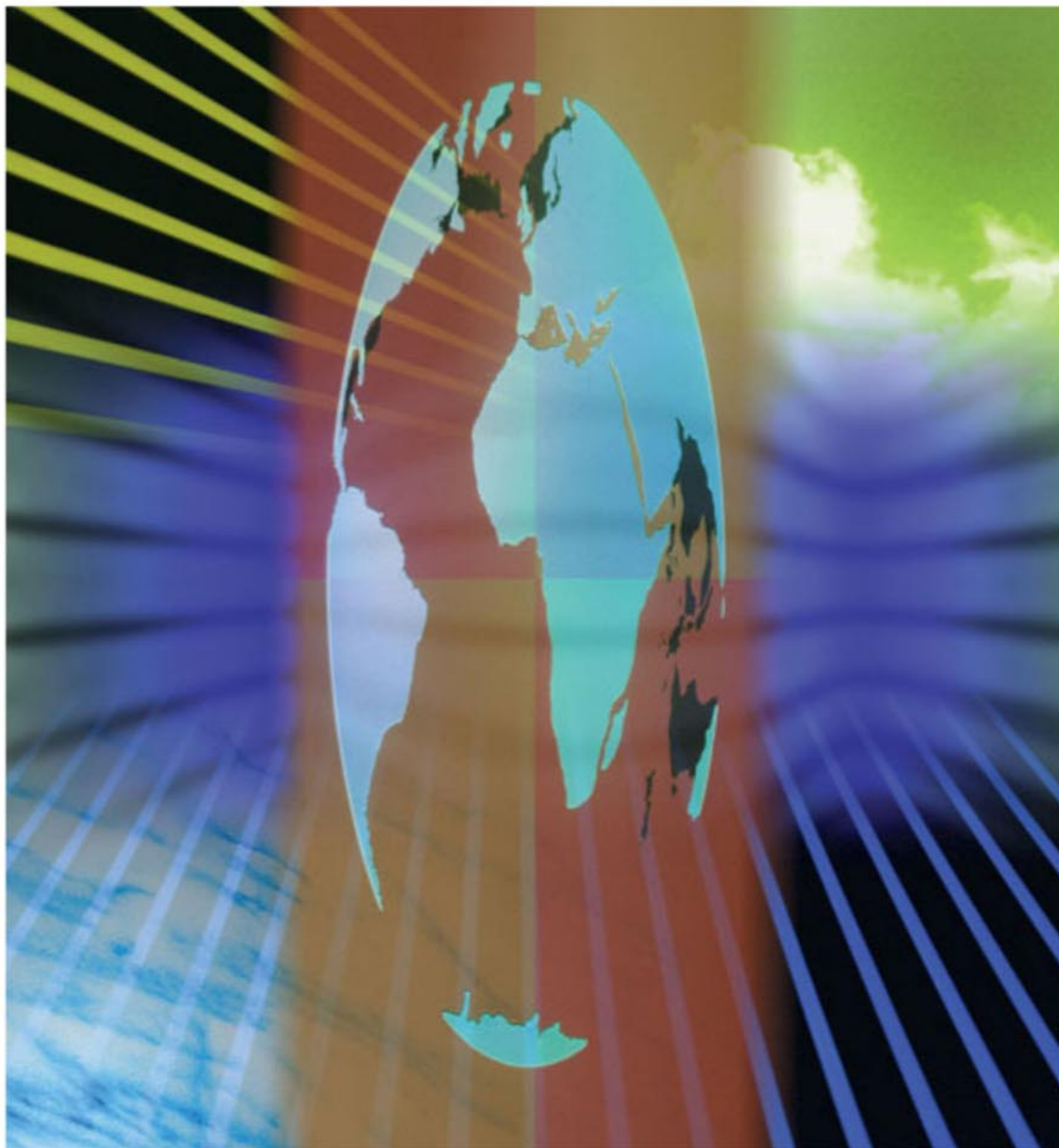


# Hydraulic Equipment



**YUKEN KOGYO CO., LTD.**

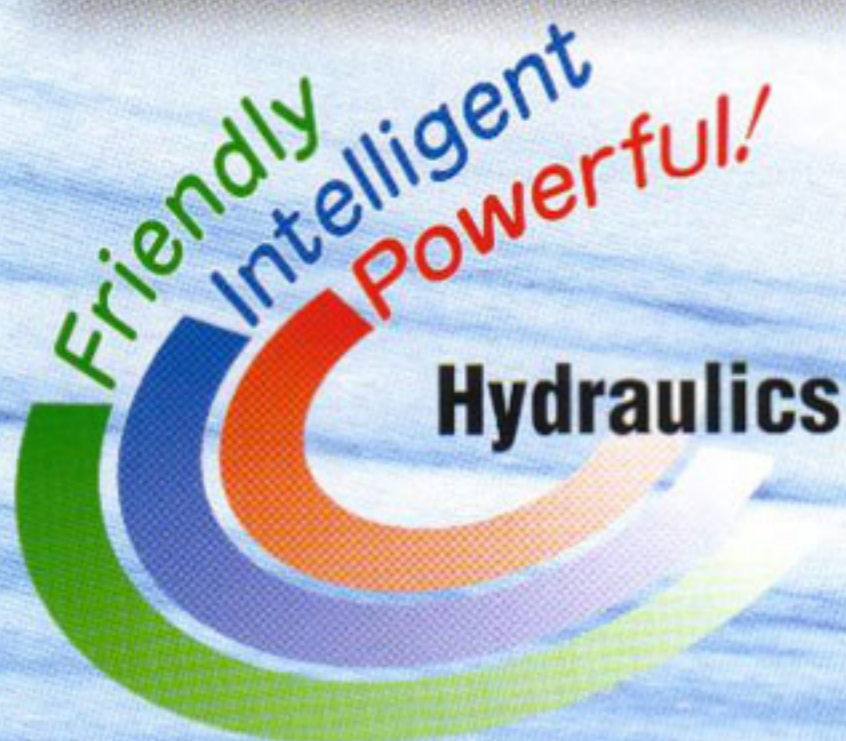
# YUKEN PRODUCTS FOR EVERY NEED

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.



Head Office & Sagami Plant



## [Head Office]

4-34, Kamitsuchidana-Naka 4-chome,  
Ayase, Kanagawa Prefecture, 252-1113, Japan  
Tel. 81-467-77-2111  
Fax. 81-467-77-3330

# INDEX

- 3 PISTON PUMPS
- 6 VANE PUMPS
- 7 PRESSURE CONTROLS
- 8 FLOW CONTROLS
- 9 DIRECTIONAL CONTROLS
- 12 MODULARS
- 16 PROPORTIONAL ELECTRO—  
HYDRAULIC CONTROLS
- 19 SERVO VALVES
- 20 ENERGY-SAVING  
HYDRAULIC UNITS  
AND CONTROLLERS



Fukuroda Factory

## [Affiliated Companies]

### UNITED KINGDOM

- **YUKEN (U.K.) LTD.**  
51 Spindus Road, Speke Hall Industrial Estate,  
Liverpool L24 1YA, ENGLAND  
Tel. 0151-486-4696  
Fax. 0151-486-3537

### TAIWAN

- **Yuken Hydraulics (T.W.) Co., Ltd.**  
(Head Office)  
No.12, 7th Road, Taichung  
Industrial Park, Taichung  
Tel. 04-2359-3077  
Fax. 04-2359-8813  
(Taipei Office)  
1F, No.97, Wun Ming Road,  
Guei Shan Township, Taoyuan County  
Tel. 03-328-3628  
Fax. 03-328-3242

### CHINA

- **Yuken Hydraulics (Zhangjiang) Co., Ltd.**  
No.9 Xinjing West Road, Zhangjiang Economic  
Development Zone, Jiangsu Province, China.  
Tel. 0512-58916711  
Fax. 0512-58913113
- **YUCI YUKEN HYDRAULICS CO., LTD.**  
Jingwei Road 256, Yuci, Jinzhong City,  
Shanxi Province P.C. 030600  
Tel. 354-2427866  
Fax. 354-2421606

### HONG KONG

- **YUKEN KOGYO (H.K) CO., LTD.**  
Flat 20, 7F., Block B, Focal Industrial Centre, 21 Man  
Lok Street, Hung Hom, Kowloon, HONG KONG  
Tel. 2362-2355  
Fax. 2765-7612
- **Dalian Yuken Trading CO., LTD.**  
R/N 1803B, World Trade Center,  
No.25 Tongxing Street,  
Zhongshan District, Dalian, P.C. 116001,  
Tel. 411-39869128  
Fax. 411-39869127

### KOREA

- **Yuken Korea Co., Ltd.**  
Room 210, Asia Bldg., 413-49 Shindorim-Dong,  
Guro-Gu, Seoul 152-887, Korea.  
Tel. 02-2675-2110  
Fax. 02-2675-2104

### INDIA

- **YUKEN INDIA LTD.**  
P.B. No.16, Whitefield Road, Whitefield,  
Bangalore-560 066  
Tel. 080-28452262  
Fax. 080-28452261

Friendly, Intelligent, Powerful

# Variable Displacement Piston Pumps

## 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.



AR16

## A Series Variable Displacement Piston Pumps

With the well-known low noise level and the new addition of A70, A90 and A145 pump versions with a maximum pressure up to 28 MPa, the A Series pump line-up offers greater coverage and specifications for a wider range of applications. Ten control types are available ranging from pressure compensator control to electro-hydraulic proportional pressure/flow control.



A37

## A3H Series Variable Displacement Piston Pumps

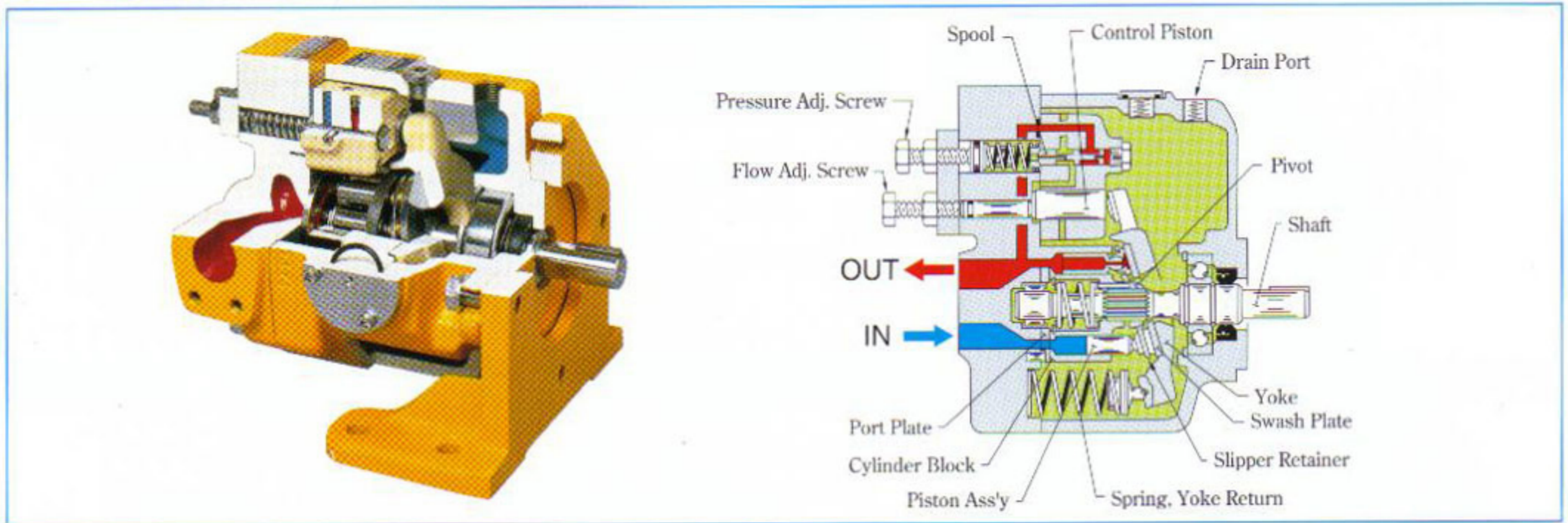
The new A3H Series variable displacement piston pump offer high pressure, high efficiency, high speed and low noise features. This pump series has been developed using Yuken's unique design concept and cumulative technologies. They are suitable for use with construction machinery and various industrial machinery ranging from presses to injection moulding machines.



A3H56

Pump Type	Maximum Operating Pressure MPa	Geometric Displacement cm <sup>3</sup> /rev													
		1	2	5	10	20	50	100	200	300					
"AR" Series Variable Displacement Piston Pumps	16				AR16	AR22									
"A" Series Variable Displacement Piston Pumps	Single Pumps	21		A10	A16										
		16			A22										
		21				A37	A56								
		28						A70	A90	A145					
			28												
Double Pumps	28	Outboard Pump			A16	A22	A37	A56							
		Inboard Pump (Driven End)			A16	A22	A37	A56	A70	A90	A145				
Variable / Fixed Double Pumps	28	Outboard Pump				RV2R1	RV2R2								
		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				

# "A" Series Variable Displacement Piston Pumps

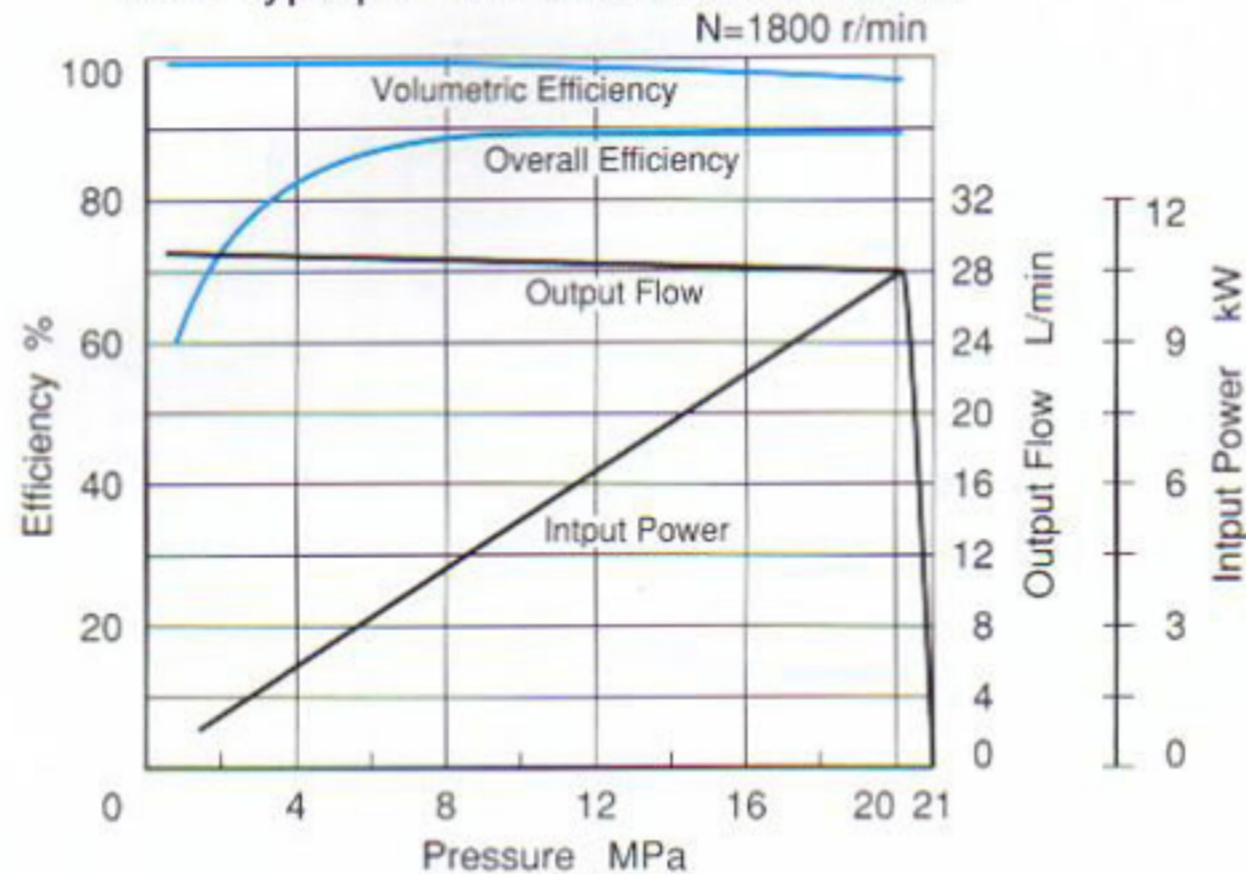


## Features

### High efficiency

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

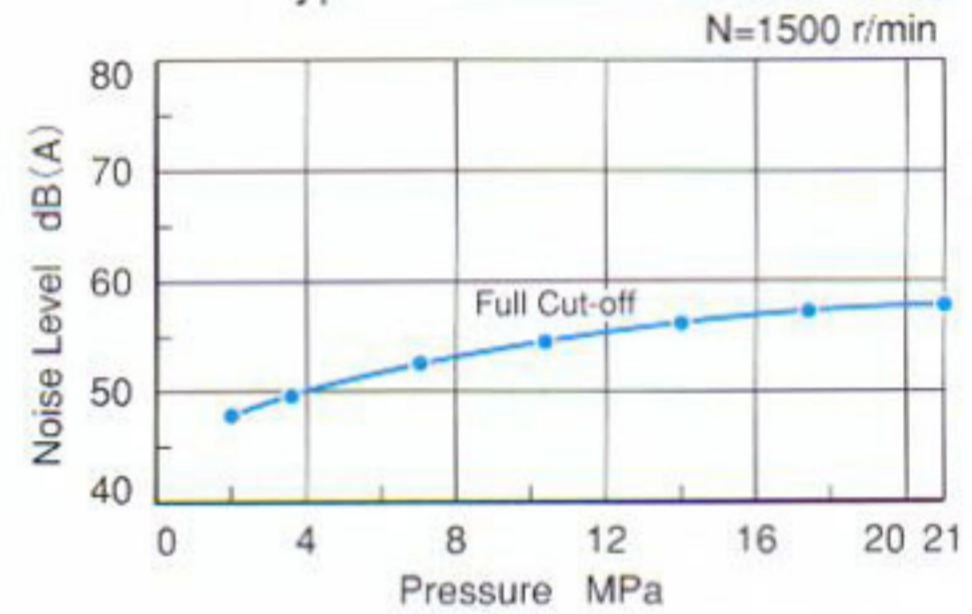
"A16" type performance characteristics



### 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.

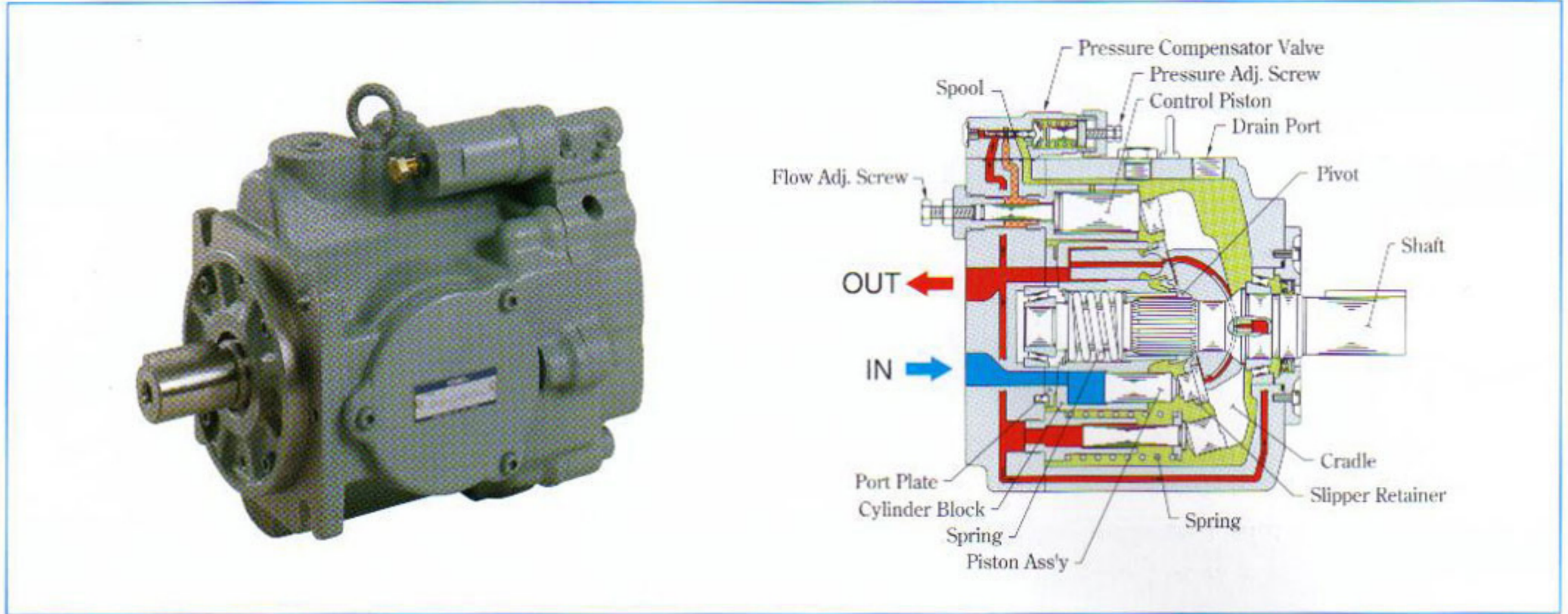
"A16" type noise level characteristics



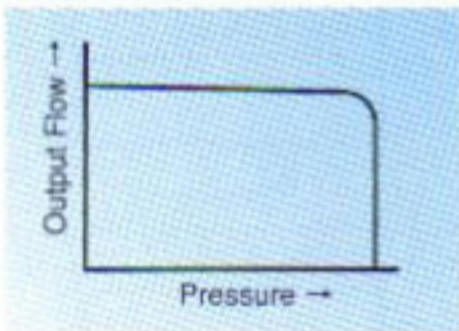
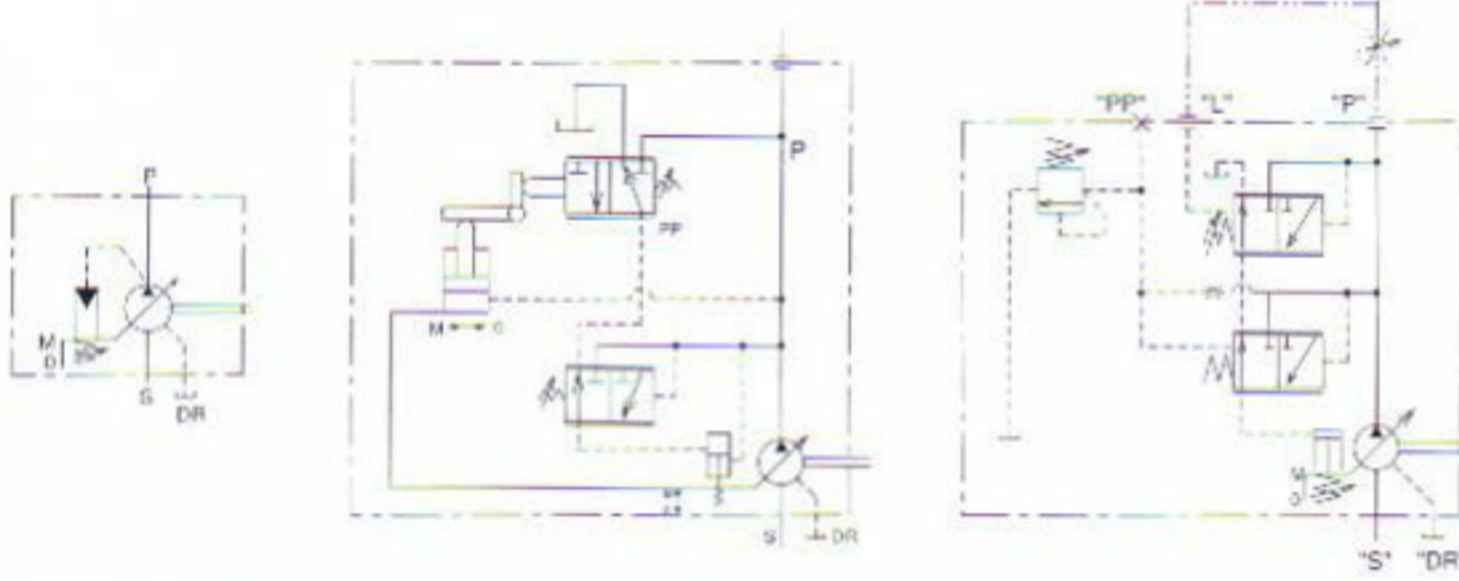
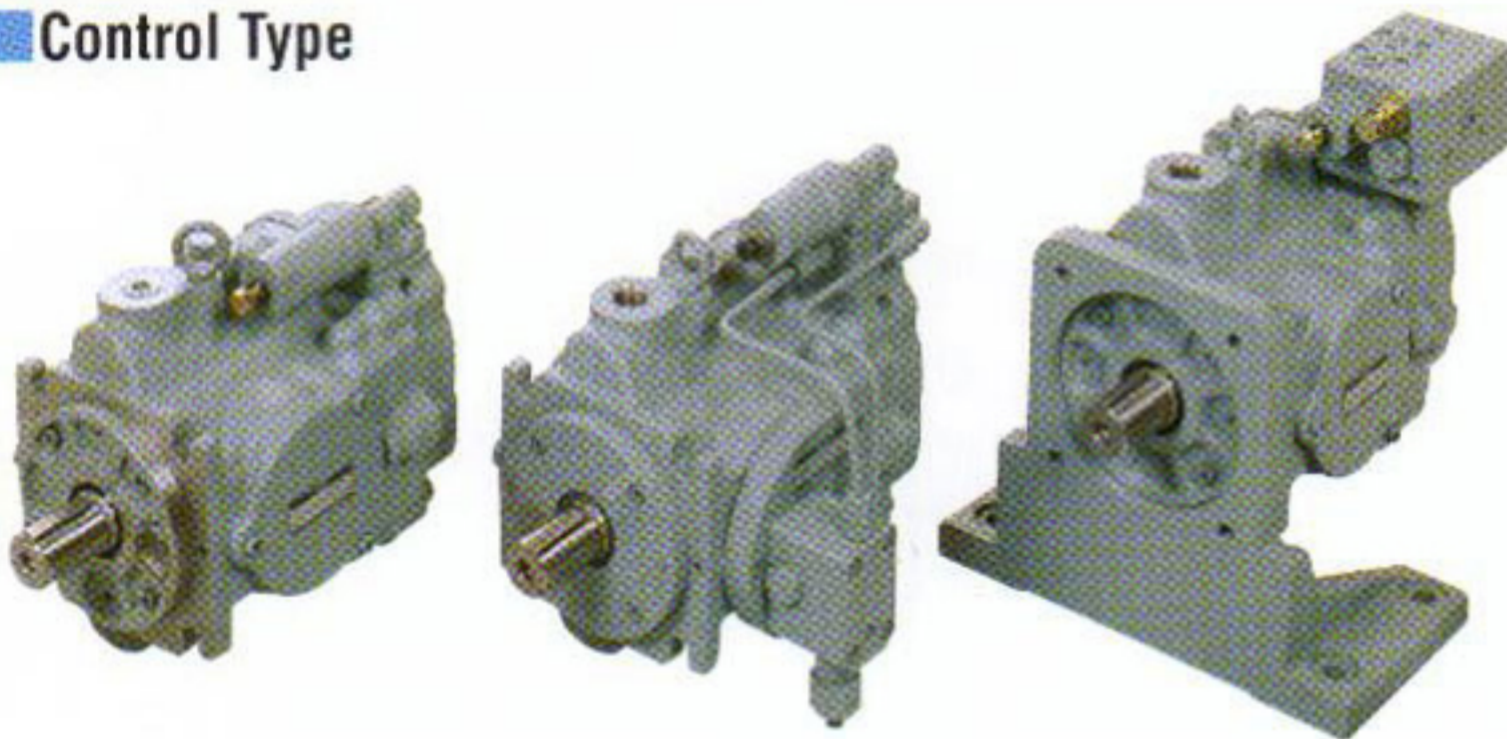
## Control Type

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)					

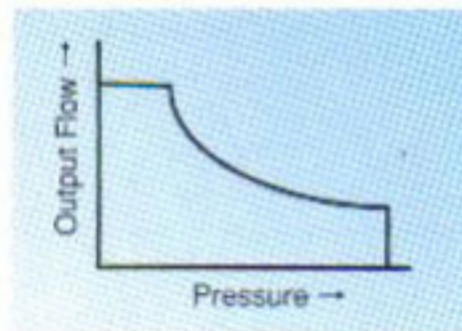
# "A3H" Series Variable Displacement Piston Pumps



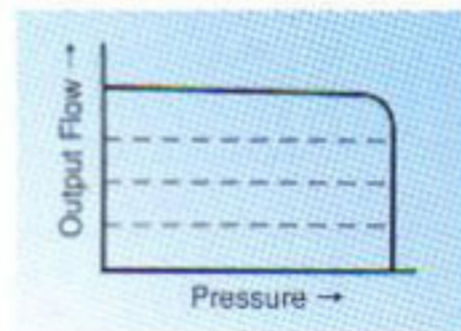
## Control Type



"01" Pressure Compensator Type



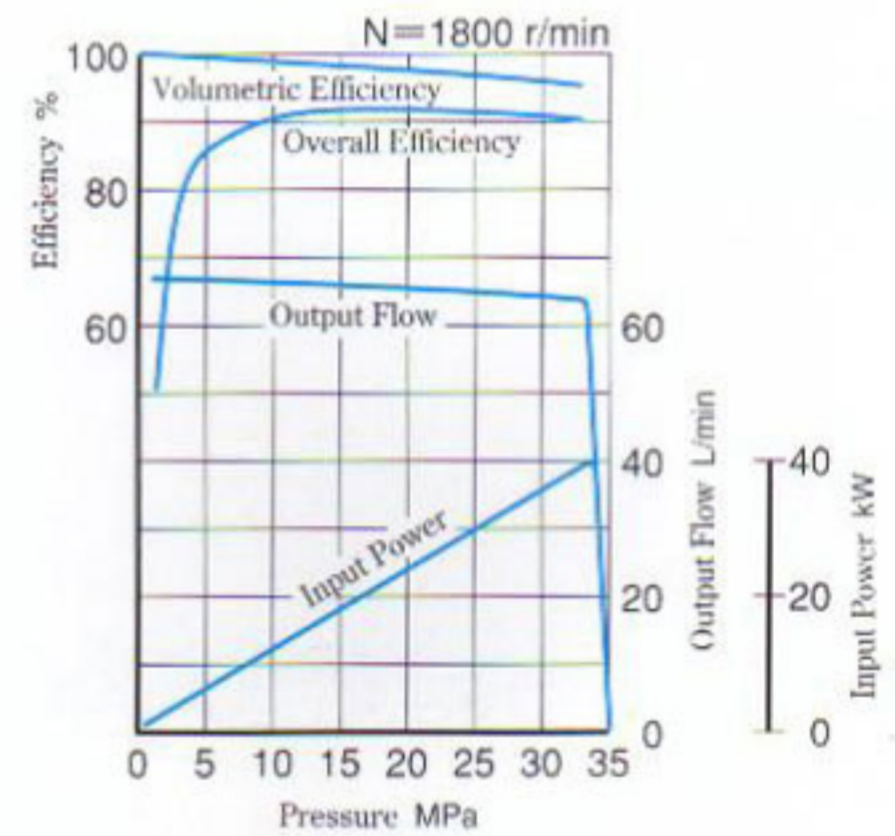
"09" Constant Power Control Type



"14" Load Sensing 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 <sup>3</sup> / rev	Minimum Adj. Flow cm <sup>3</sup> / rev	Operating Pres. MPa		Shaft Speed Range r/min		Mass kg (01 Control type)	
			Rated	Intermittent	Max.	Min.	Flange Mtg.	Foot Mtg.
A3H16-#R01KK	16.3	8	28	35	3600	600	14.5	23.4
A3H37-#R01KK	37.1	16			2700	600	19.5	27.0
A3H56-#R01KK	56.3	35			2500	600	25.7	33.2
A3H71-#R01KK	70.7	45			2300	600	35.0	42.5
A3H100-#R01KK	100.5	63			2100	600	44.6	72.6
A3H145-#R01KK	145.2	95			1800	600	60.0	88.0
A3H180-#R01KK	180.7	125			1800	600	70.4	98.4

Friendly, Intelligent, Powerful

# Vane Pumps

Various models, ranging from low-noise low-pulsation small capacity models to low-noise high pressure models, are available in Yuken vane pumps for customers' best selection.



## 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<sup>3</sup>/rev.

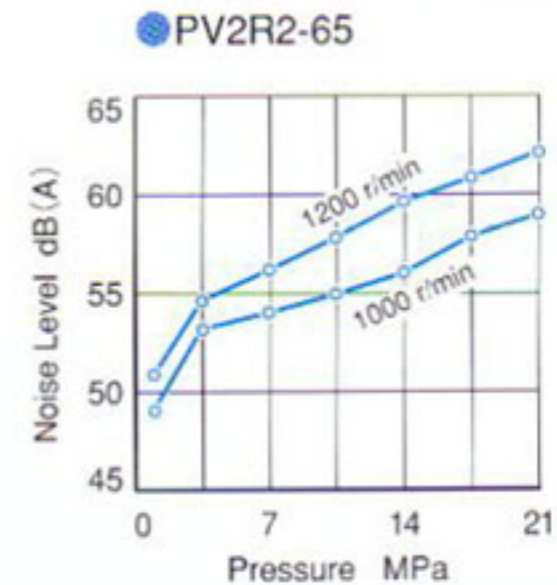
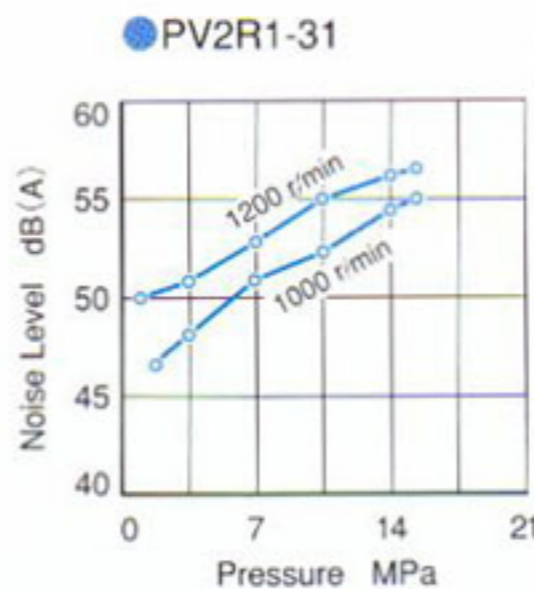
- Model .....PV2R1, PV2R2, PV2R3, PV2R4 and Double Pumps.
- Max.Operating Pressure .....21MPa
- Geometric Displacement .....PV2R1 : 5.8~31/PV2R2 : 41.3~64.7  
PV2R3 : 76.4~115.6/PV2R4 : 136~237cm<sup>3</sup>/rev



### Noise Level

#### ● Measuring condition

- Fluid viscosity : 20mm<sup>2</sup>/s
- Measurement position : One metre horizontally away from pump head cover
- Background noise : 40dB(A)



## PV11R Series Vane Pumps

The PV11R Series pumps are durable up to pressures as high as 40 MPa. The problem of excessive wear to the vanes and cam ring, which usually occurs in such high pressure vane pumps, has been resolved through special methods in both mechanical construction and lubrication systems.

- Model .....PV11R10, PV11R20
- Max.Operating Pressure .....40MPa (Anti-Wear Type Oils)  
25MPa (R&O Type Oils)
- Geometric Displacement .....PV11R10 : 2.2~12.1cm<sup>3</sup>/rev  
PV11R20 : 15.2~22.1cm<sup>3</sup>/rev

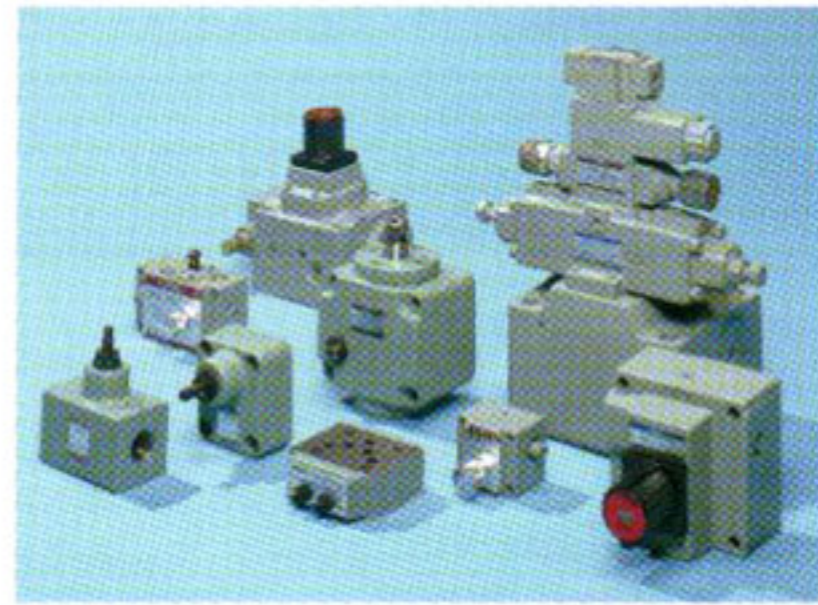


Pump Type	Maximum Operating Pressure MPa	Output Flow L/min at 1200 r/min at No-Load												
		1	2	5	10	20	50	100	200	500	800			
"PVL" Series Single Pumps	5			PVL1										
Single Pumps	7					50T	150T	250F	500F					
Double Pumps	7			Small Volume	(50)	(150)	(250)							
				Large Volume	(50)	(150)	(250)							
Combination Pumps	7			Small Volume	(50)									
				Large Volume	(50)	(150)								
"PV2R" Series Single Pumps	21					PV2R1	PV2R2	PV2R3	PV2R4					
"PV2R" Series Double Pumps	21			Small Volume	(PV2R1)	(PV2R2)	(PV2R3)							
				Large Volume	(PV2R2)	(PV2R3)	(PV2R4)							
"PV11R" Series Single Pumps	40					PV11R10	PV11R20							

Friendly, Intelligent, Powerful

# 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.

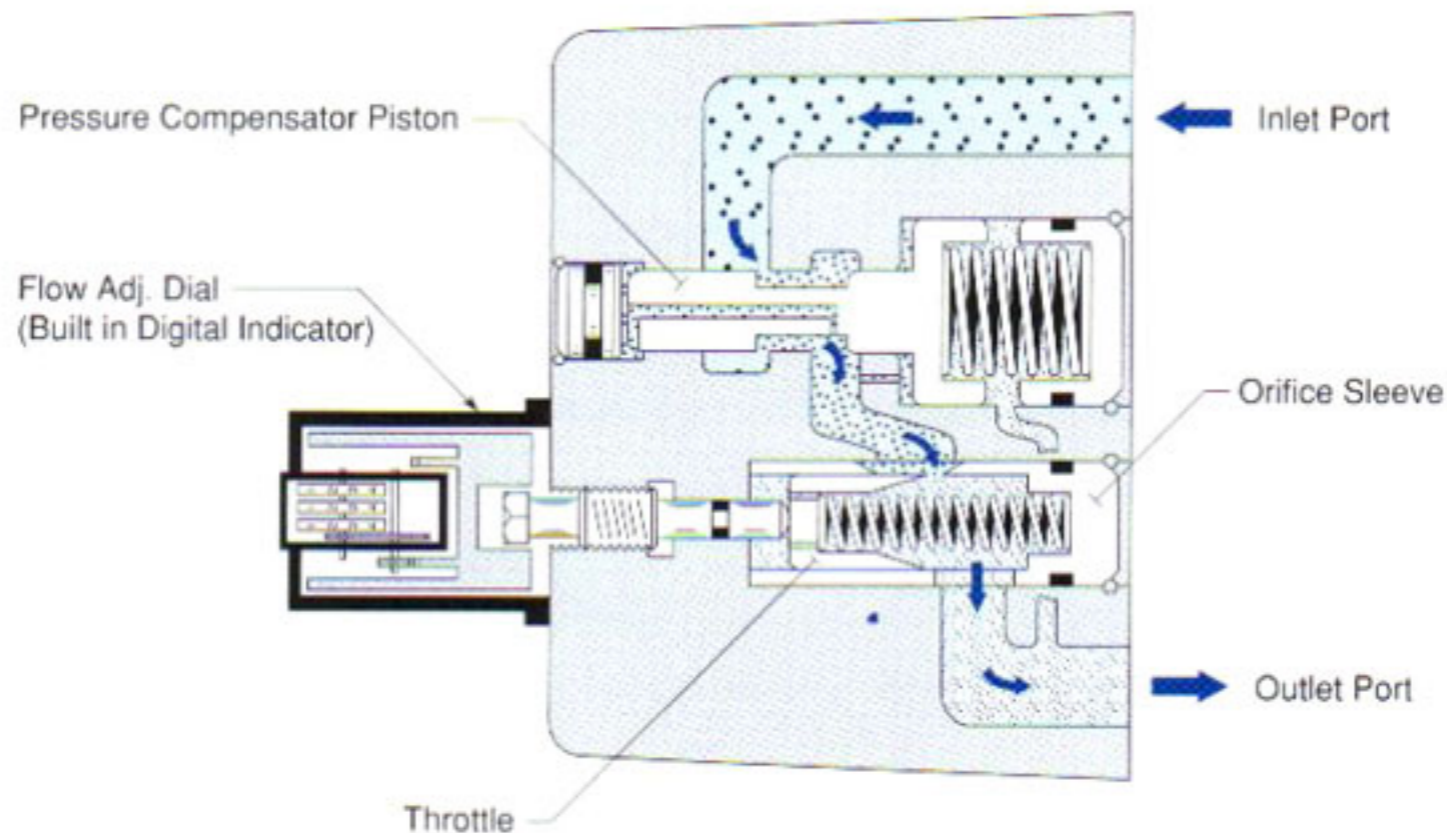


## Flow Control Valves/Flow Control and Check Valves

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



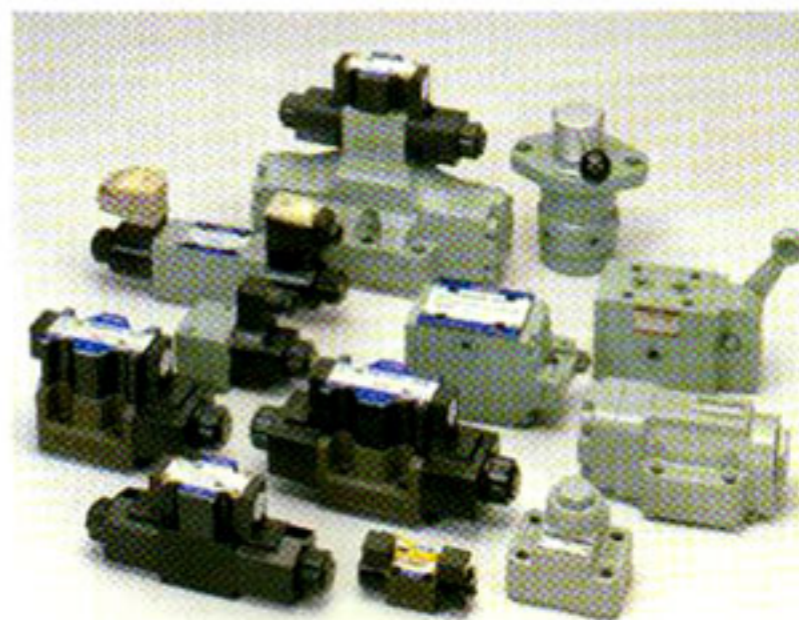
Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min																
		1	2	3	5	10	20	30	50	100	200	300	500	1000	2000	3000	5000	
Flow Control (& Check) Valves	21	FG/FCG			01			02			03	06	10					
Flow Control & Relief Valves	25	FBG									03	06	10					
Pilot Operated Flow Control Valves	21	FHG						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 Flow)				
One Way Restrictors	25	SRCT/SRCG								03	06	10	16	(Rated Flow)				
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																



Friendly, Intelligent, Powerful

# Directional Control Valves

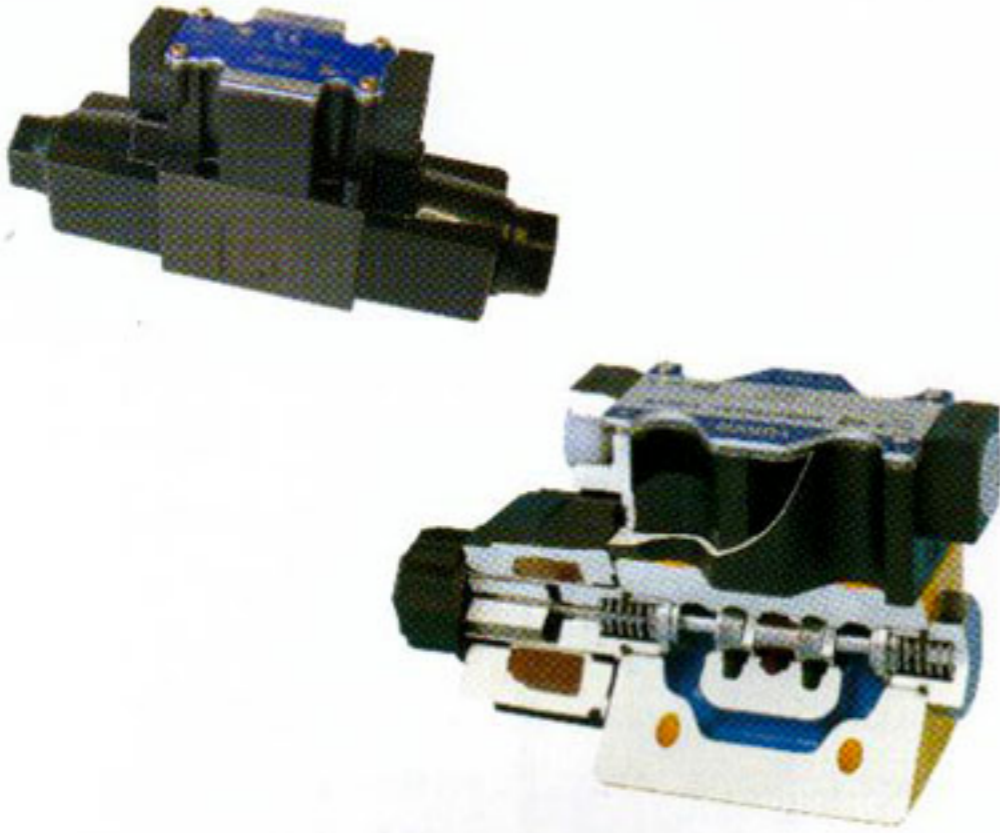
These valves control the flow direction in the hydraulic circuit. The various directional valves ranging from the solenoid operated directional valves to the check valves which conform to JFPS Standard (The Japan Fluid Power Standard) are available to meet the variety in customers' needs.



Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min										
		1	2	5	10	20	50	100	200	500	1000	2000
Solenoid Operated Directional Valves	25	DSG-005										
	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 <sub>C</sub> <sup>T</sup> -02) 02										
	25	Cam operated (DC <sub>C</sub> <sup>T</sup> ) 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) 03 06 10 (Rated Flow)										
		Sub-plate mounting (CP*G) 03 06 10 (Rated Flow)										
		Flanged connection (CP*F) 10 16 (Rated Flow)										

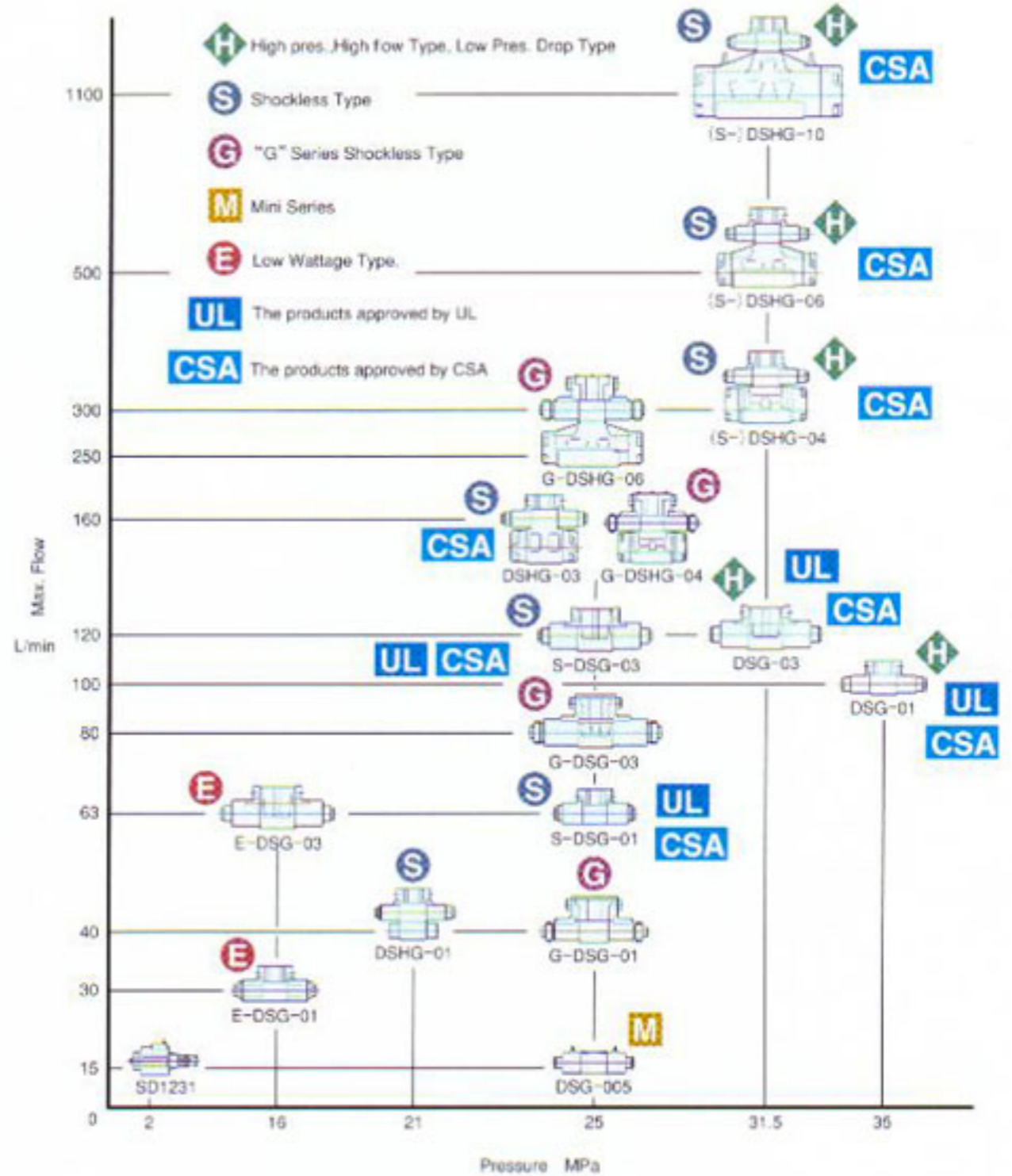
## Solenoid Operated Directional Valves / Solenoid Controlled Pilot Operated Directional Valves

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

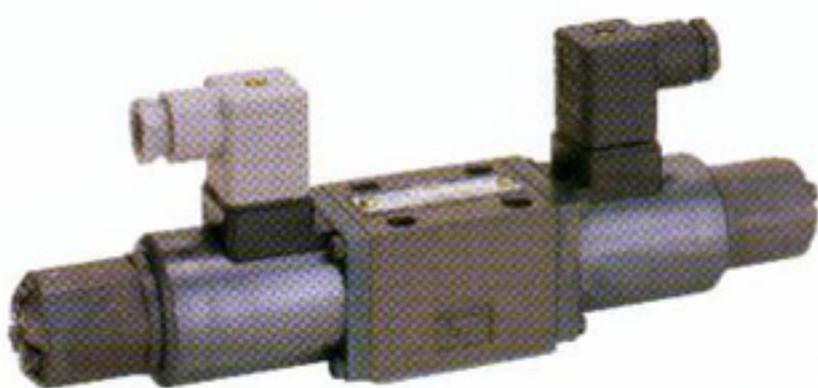
Shockless type proportional and flow control valves have been developed by employing the basic design concept of "G" series solenoid operated directional valves.

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 slope 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

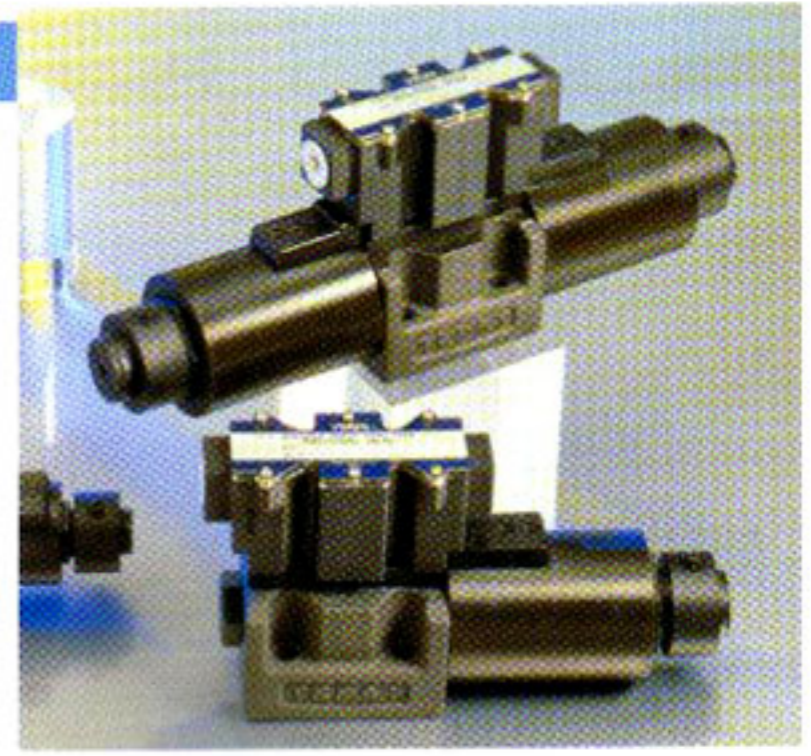
- Model .....AMN-G
- Power Supply .....DC 24V (20~30V)
- Max. Input Power .....35W



## "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.

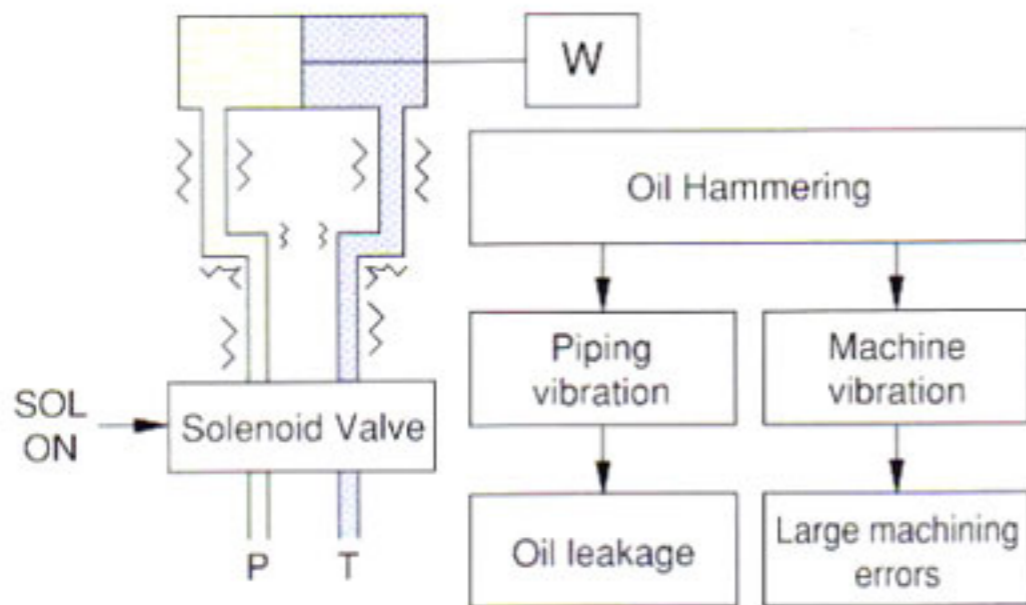
These valves feature less pipe leakage and offer more accurate control and improve the reliability of the machinery on which they are used.



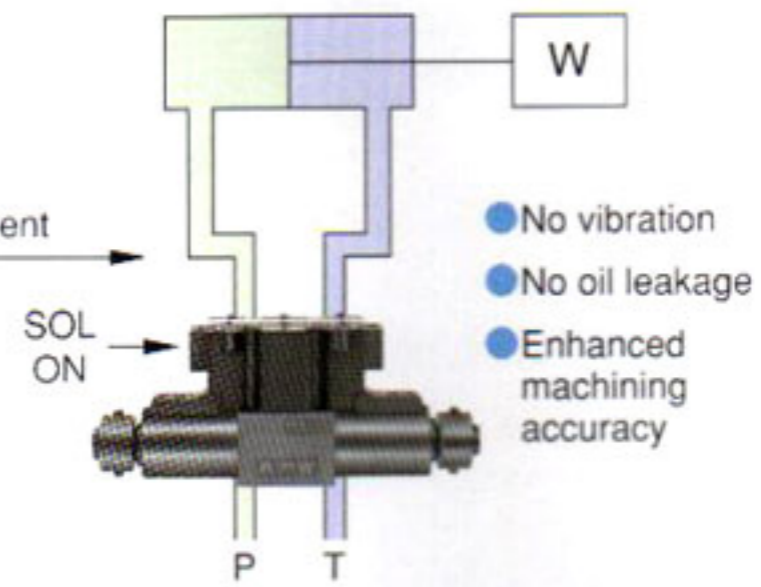
### Your valuable machines are protected from vibration and shocks

Shocks caused by acceleration and deceleration are reduced.

#### Conventional Type

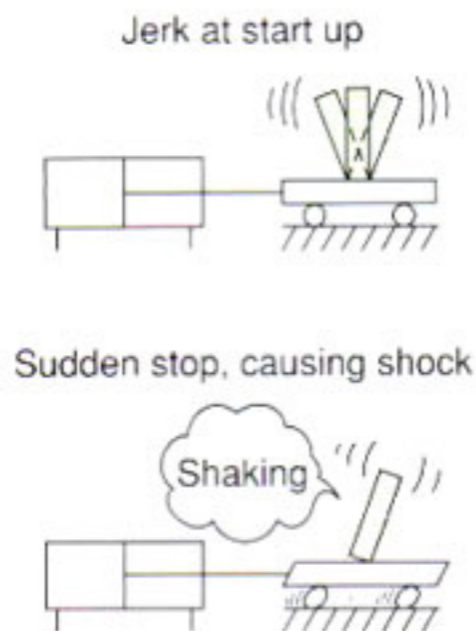


#### G-Series Valve

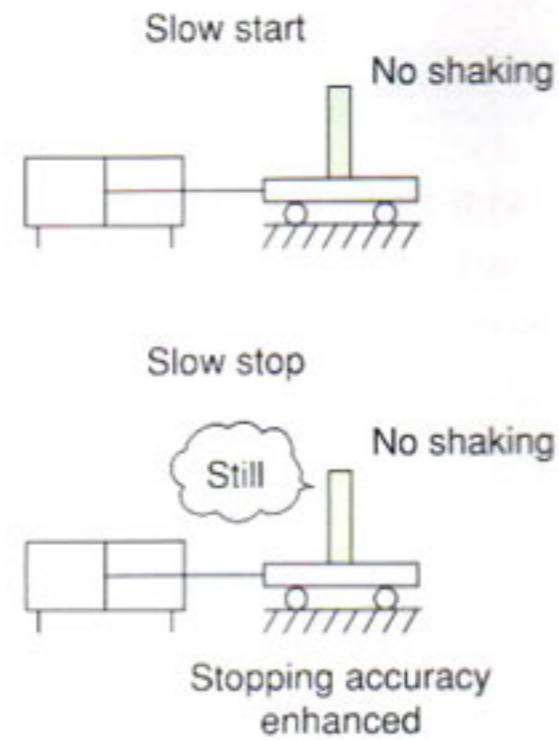


Oil hammering during spool shifting is reduced.

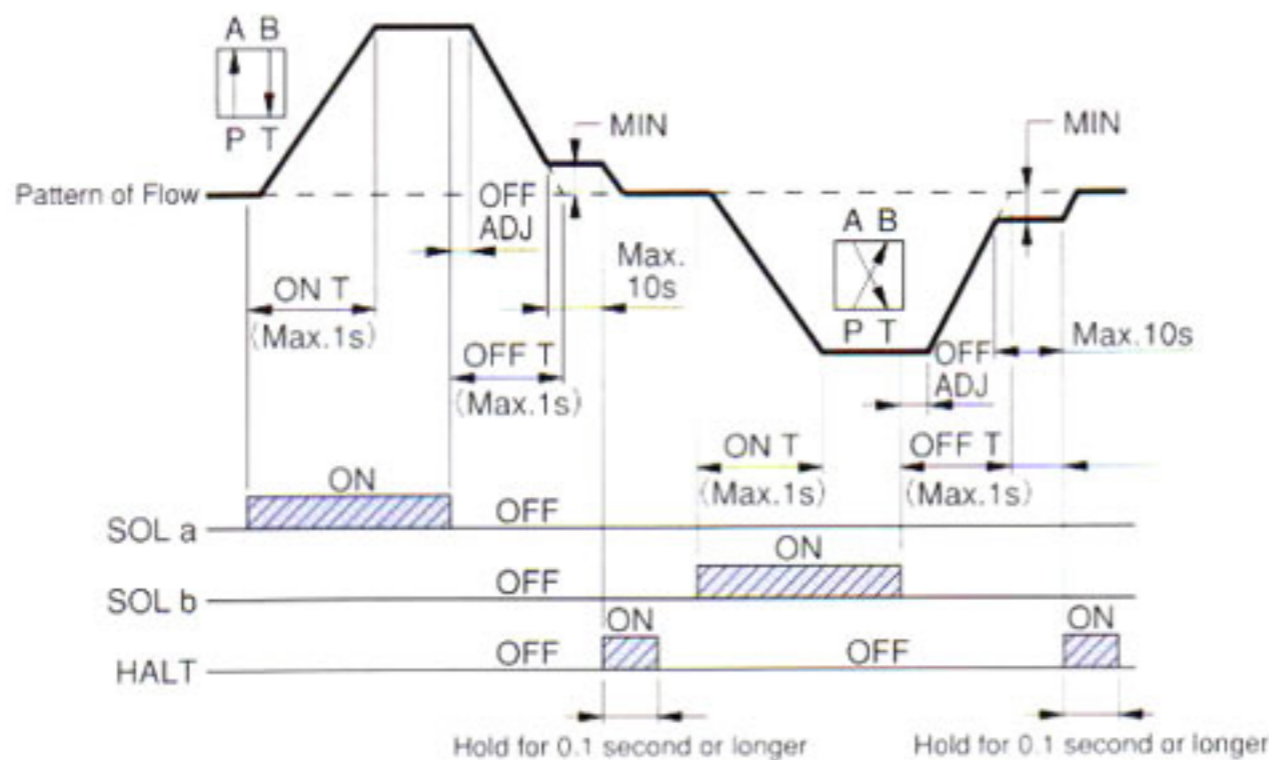
#### Conventional Type



#### G-Series Valve



Relationships between SOL signals and flow patterns

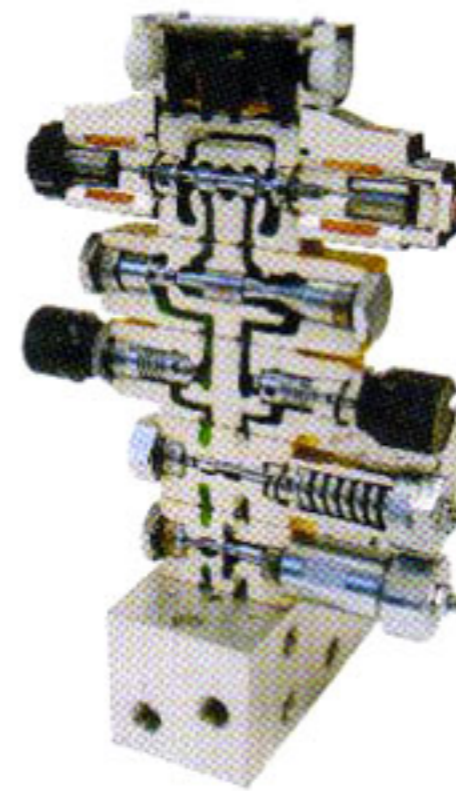
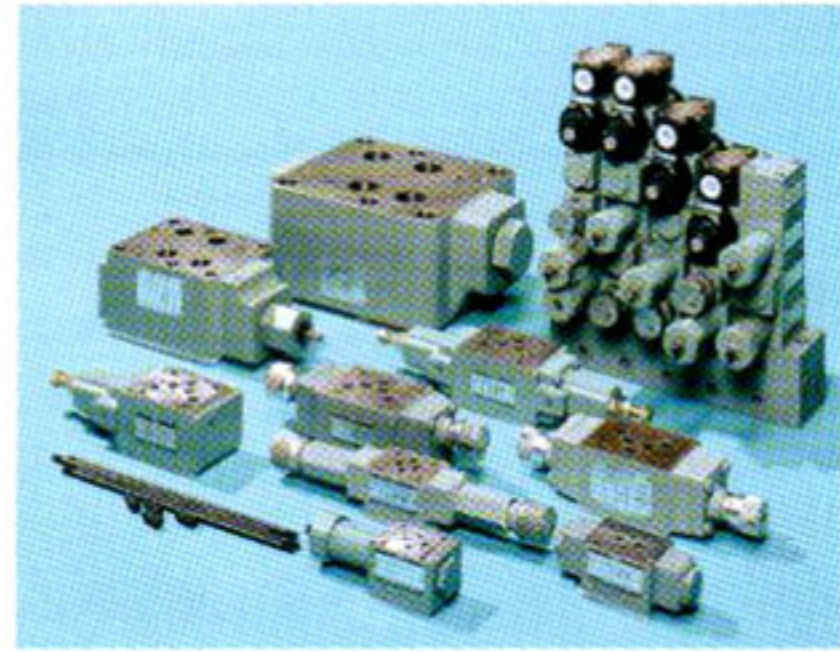


Friendly, Intelligent, Powerful

# 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 Series Modular Valves	25	[Flow range indicated by yellow bar]										
01 Series Modular Valves	31.5	[Flow range indicated by yellow bar]										
03 Series Modular Valves	25	[Flow range indicated by yellow bar]										
06 Series Modular Valves	25	[Flow range indicated by yellow bar]										
10 Series Modular Valves	25	[Flow range indicated by yellow bar]										

★Max Flow for Throttle and Check Modular Valves.

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

● Pressure Controls

Name	Graphic Symbols	Model Numbers	Graphic Symbols	Model Numbers
		"005/01" Series		"03" Series
Solenoid Operated Directional Valves		DSG-005 DSG-01		DSG-03
Relief Modular Valves		MBP-005		MBP-03
		MBP-01		MBP-03
		MBA-01		MBA-03
		MBB-01		MBB-03
				MBW-03
Reducing Modular Valves		MRP-005		MRP-03
		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
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 005/01/03 Series Modular Valves (Flow Controls, Directional Controls, Others)

### ● Flow Controls

### ● Directional Controls

Name	Graphic Symbols				Model Numbers
	P	T	B	A	
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-01-X MSA-03-X
					MSA-01-Y MSA-03-Y
					MSB-01-X MSB-03-X
					MSB-01-Y MSB-03-Y
					MSW-005-X MSW-01-X MSW-03-X
					MSW-005-Y MSW-01-Y MSW-03-Y
					MSW-01-XY
					MSW-01-YX

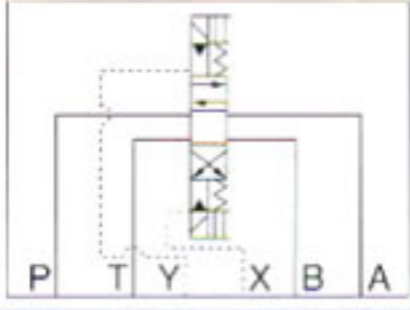



Name	Graphic Symbols				Model Numbers
	P	T	B	A	
Check Modular Valves					MCP-005 MCP-01 MCP-03
					MCA-03
					MCB-03
					MCT-01 MCT-03
Anti-Cavitation Modular Valves					MCPT-03
					MAC-01 MAC-03
Pilot Operated Check Modular Valves					MPA-01 MPA-03
					MPB-005 MPB-01 MPB-03
					MPW-005 MPW-01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

### ● Modular Plates and Mounting Bolts

Name	Graphic Symbols				Model Numbers
	P	T	B	A	
End Plates					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-01 MMC-03
Bolt Kits					MBK-005 MBK-01 MBK-03

## List of 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-06 DSHG-10
Reducing Modular Valves		MRP-06 MRP-10
		MRA-06 MRA-10
		MRB-06 MRB-10



005 Series

### ● Flow Controls

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



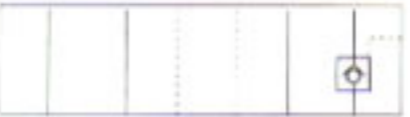

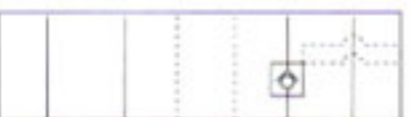
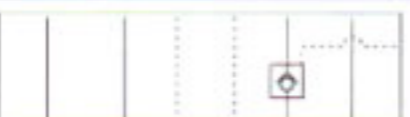



01 Series  
MSW-01



03 Series  
MPW-03

### ● Directional Controls

Name	Graphic Symbols	Model Numbers
Pilot Operated Check Modular Valves		MPA-06 MPA-10
		MPA-06*-*-X MPA-10*-*-X
		MPA-06*-*-Y MPA-10*-*-Y
		MPB-06 MPB-10
		MPB-06*-*-X MPB-10*-*-X
		MPB-06*-*-Y MPB-10*-*-Y
Mounting Bolt Kits		MPW-06 MPW-10
		MBK-06 MBK-10



06 Series  
MPW-06



10 Series  
MSW-10

Friendly, Intelligent, Powerful

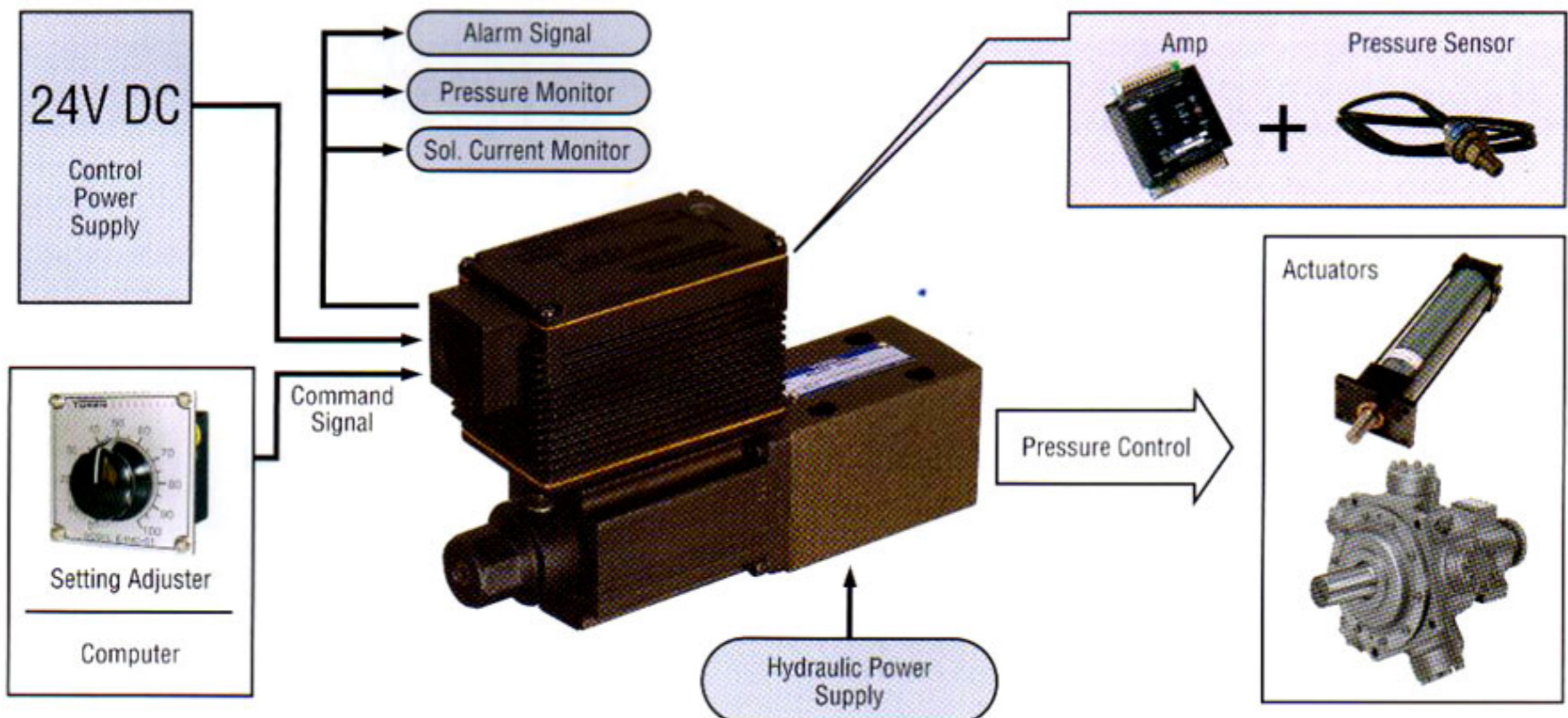
# Proportional Electro — Hydraulic Controls

## 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														
Relief Valves	24.5	EHBG								03	06	10				
Reducing & Relieving Valves	24.5	EHRBG								06	10					
Flow Control (& Check) Valves	24.5	EHFG/EHFCG								03	06					
Flow Control & Relief Valves	24.5	EHFBG								03	06	10				
Directional & Flow Cont. Valves	24.5	EHDFG							01	03						
High Response Type Directional & Flow Cont. Valves	15.7	EHDFG									04	06				

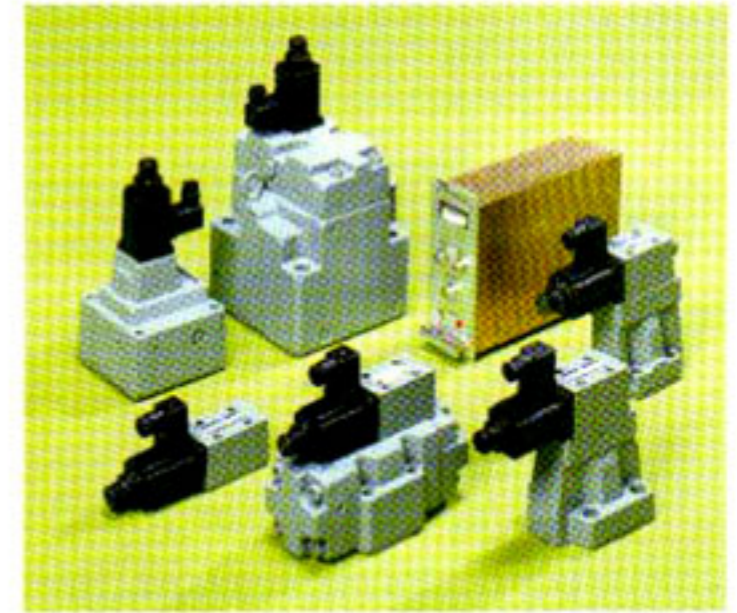
Note) Setting adjusters are also available.





## 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.

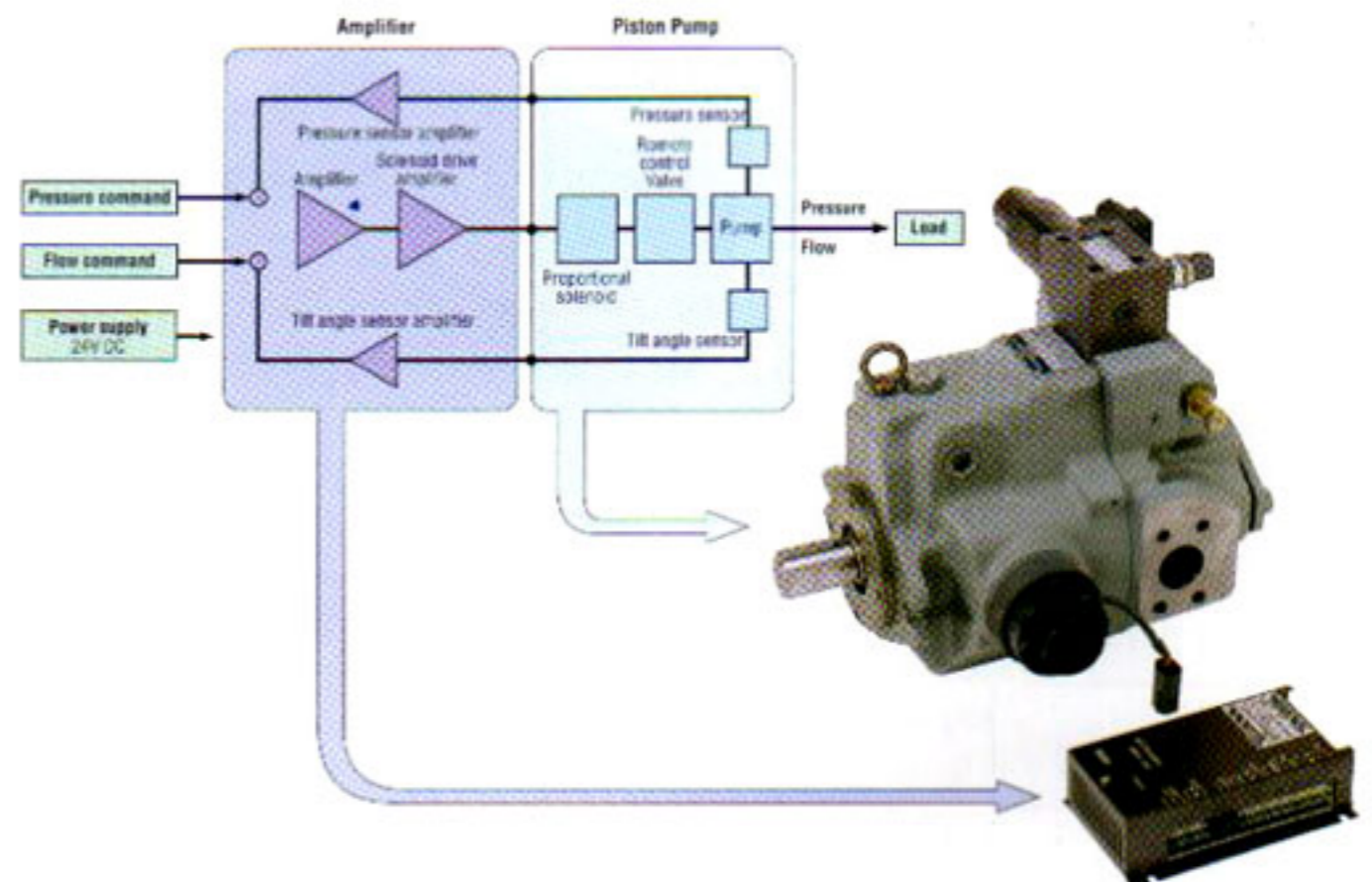


Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min													
		1	2	3	5	10	20	30	50	100	200	300	500	1000	
Pilot Relief Valves	24.5	EDG-01													
Relief Valves	24.5			EBG						03	06	10			
Reducing & Relieving Valves	24.5	ERBG								06	10				
Flow Control (& Check) Valves	20.6	EFG/EFCG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

Note) Power amplifiers and setting adjusters are also available.

## "A" Series Variable Displacement Piston Pumps Electro-Hydraulic Proportional Pressure & Flow Control Type (04E Type)

The pumps with 04E control type enjoy a high reputation in the industrial machinery and equipment sectors, including the injection moulding machines. They are direct control type piston pumps developed on the same basic concept as the EH series variable displacement pumps and meet the customers' requirements for digital control. They provide a wide range of displacement capacities as from 15.8 to 145 cm<sup>3</sup>/rev.



### Specifications

Model Numbers	Geometric Displacement cm <sup>3</sup> /rev	Operating Pres. MPa		Shaft Speed Range r/min	Max. Flow at 1800r/min L/min	Hysteresis	Repeatability	Input Signal	Supply Electric Power
		Rated	Intermittent						
A16-※R04E	15.8	16	21	600~1800	28.4	Less than 1%	Less than 1%	Max. Flow/ 5V DC Specified Control Pressure/ 5V DC	24V DC (21~28V Included Ripple)
A22-※R04E	22.2	16	16		40.0				
A37-※R04E	36.9	16	21		66.4				
A56-※R04E	56.2	16	21		101				
A70-※R04E	70.0	25	28		126				
A90-※R04E	91.0	25	28		163				
A145-※R04E	145	25	28		261				

## High Response Type Proportional Directional and Flow Control Valves / Amplifiers

High response, high precision and high reliability are achieved by a combination of a compact and powerful solenoid and a spool-position-detection LVDT.

Direct type ELDFG-01/03 and two stage type ELDFHG-04/06 (which use the ELDFG-01 as a pilot) are available.

- **Fast response, high precision, and high reliability using closed-loop model**

Fast response plus high precision and high reliability are achieved by a combination of a compact, powerful solenoid and a spool-position-detection LVDT.

- **52 Hz/-3 dB ( $\pm 25\%$  amplitude, ELDFG-01) response equivalent to simplified servo valve**

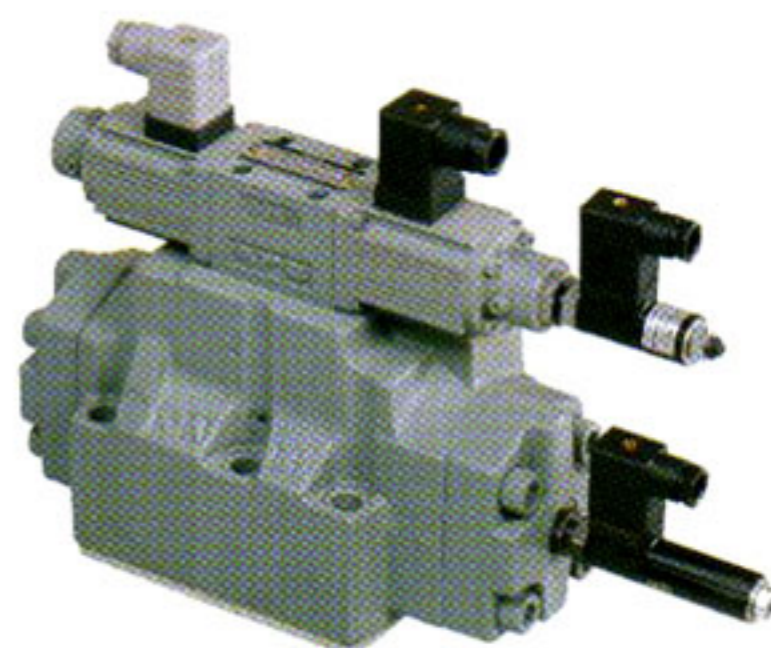
This product can be interchanged with the simplified servo valve to perform position control and pressure control.

- **Excellent contamination resistance**

Compared to servo valve nozzle flapper type, this product has excellent contamination resistance, which greatly reducing contamination-related problems.



Direct Type — ELDFG-01



Two Stage Type — ELDFHG-06

### Specifications

Model Numbers	Rated Flow ELDFG-01, 03 : @1.5MPa ELDFG-04, 06 : @1.0MPa L/min	Max. Operating Pressure MPa	Max. T-Line Back Pressure MPa	Repeatability %	Step Response 0→100%V ms	Frequency Response ( $\pm 25\%$ / $-90\text{degree}$ ) Hz
ELDFG-01	10, 20, 35	31.5	21	Less than 0.5%	30	48
ELDFG-03	40, 80	31.5			29	36
ELDFHG-04	280	35			13	46
ELDFHG-06	350	35			15	66
	500	31.5			18	39

### Amplifiers

- **DIN Specifications (euro card : AMB-EL)**

The euro card used in the power amplifier is single height 3U (100×160 mm). This amplifier can be easily mounted in a rack and allows for excellent heat dissipation.



AMN-L

### Specifications

- Model ..... AMN-L-01 / AMB-EL-03, 04, 06
- Max. Output Current ..... 2.5 A (AMN-L-01)  
3.0 A (AMB-EL-03)  
2.5 A (AMB-EL-04, 06)
- Power Supply ..... 20~30 V DC (AMN-L-01)  
21~28 V DC (AMB-EL-03, 04, 06)
- Power Input (Max.) .....  $\pm 10$  V (AMN-L-01)  
 $\pm 10$  V /  $\pm 5$  V (AMB-EL)



AMB-EL

Friendly, Intelligent, Powerful

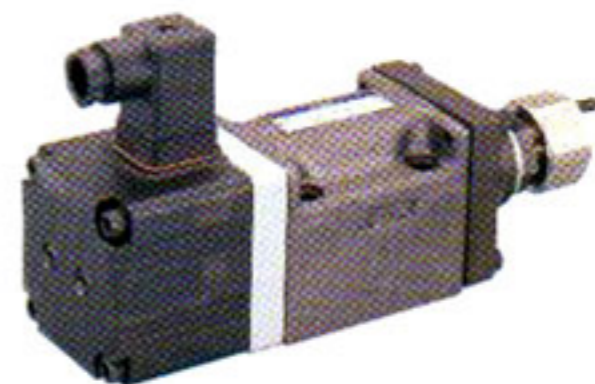
# Servo Valves

## High-speed Linear Servo Valves/Servo Amplifiers

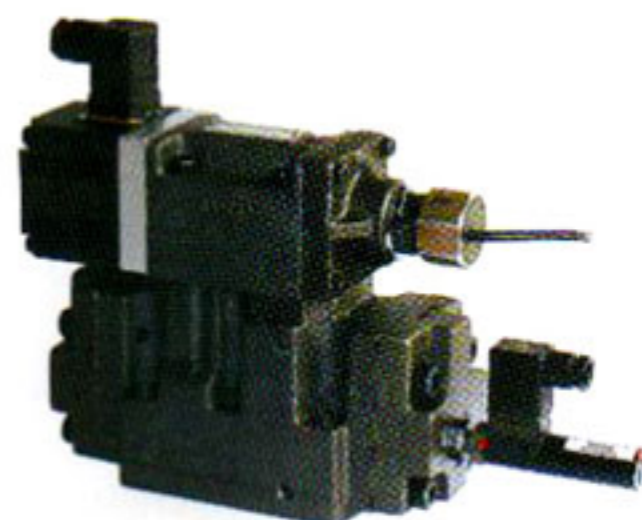
High-speed linear servo valves have outstanding features of high response and exceptional contamination resistance. These features are achieved by the compact and powerful linear motor which directly drives the spool and gives electric feedback of the spool position. These valves have garnered an excellent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

### Specifications

Model Numbers	Rated Flow ( $\Delta P=7\text{MPa}$ ) L/min	Max. Operating Pressure MPa	Step Response 0 $\leftrightarrow$ 100%V ms	Frequency Response ( $\pm 25\%$ / $-90\text{deg.}$ ) Hz
Direct Type	LSVG-03	40, 10, 20, 40	2	450
		60	3	410
Two Stage Type	LSVHG-04	750	8	110
		900	8	105
		1300	10	100
	LSVHG-10	1500	8	100



Direct Type — LSVG-03



Two Stage Type — LSVHG-04



Linear Servo Amplifiers — AMLS

## 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.

### 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.

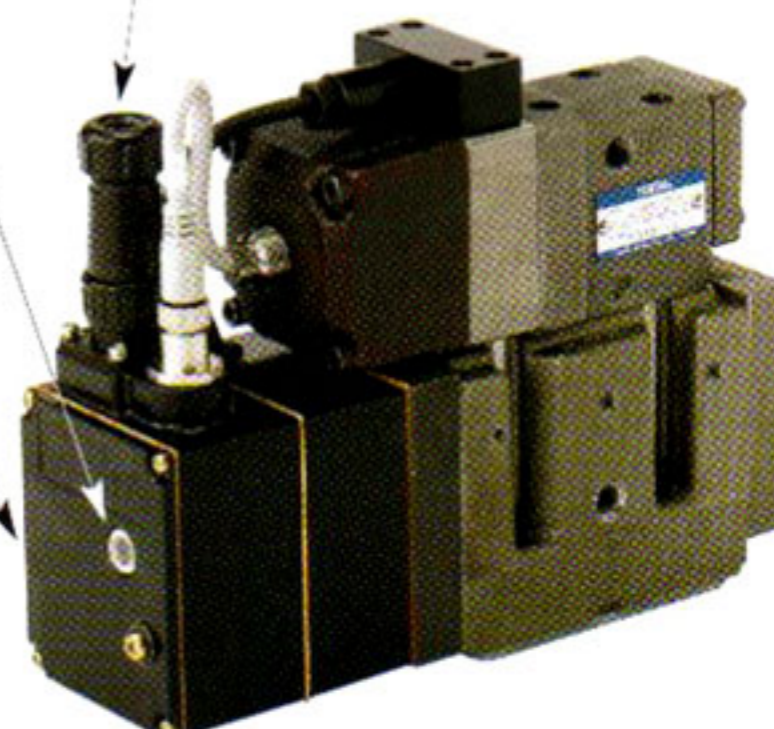
Colour	Description of Alarm Indicator
Green	Indication of power supply (Normal operation)
Red	Deviation alarm for the pilot valve
Yellow	Deviation alarm for the main valve

#### 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.

#### Simple

Highly accurate hydraulic control can be obtained only by supplying 24 V DC power and inputting a command signal.



### Specifications

Model Numbers	Rated Flow ( $\Delta P=7\text{MPa}$ ) L/min	Max. Operating Pressure MPa	Step Response 0 $\leftrightarrow$ 100%V ms	Frequency Response ( $\pm 25\%$ / $-90\text{deg.}$ ) Hz
LSVHG-03EH-230	230	31.5	8	110
LSVHG-03EH-270	270	31.5	7	110
LSVHG-04EH-750	750	35	11	90
LSVHG-06EH-900/1300	900/1300	35/31.5	11/15	90/70

# 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

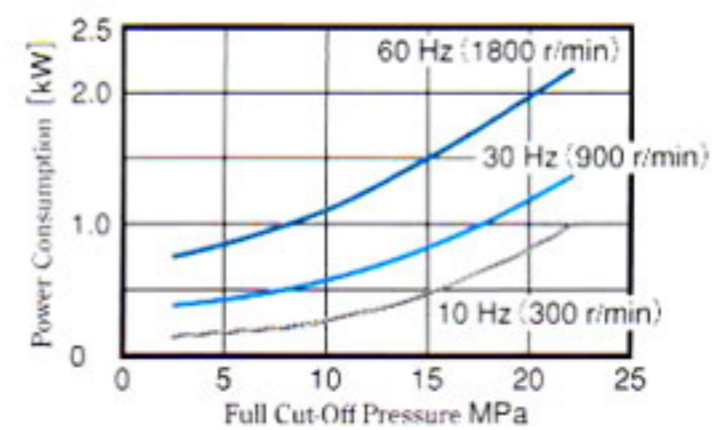
● Rotational frequency control is effective for reducing power loss.

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 three 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 vane pump <YM-e Pack>
- 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



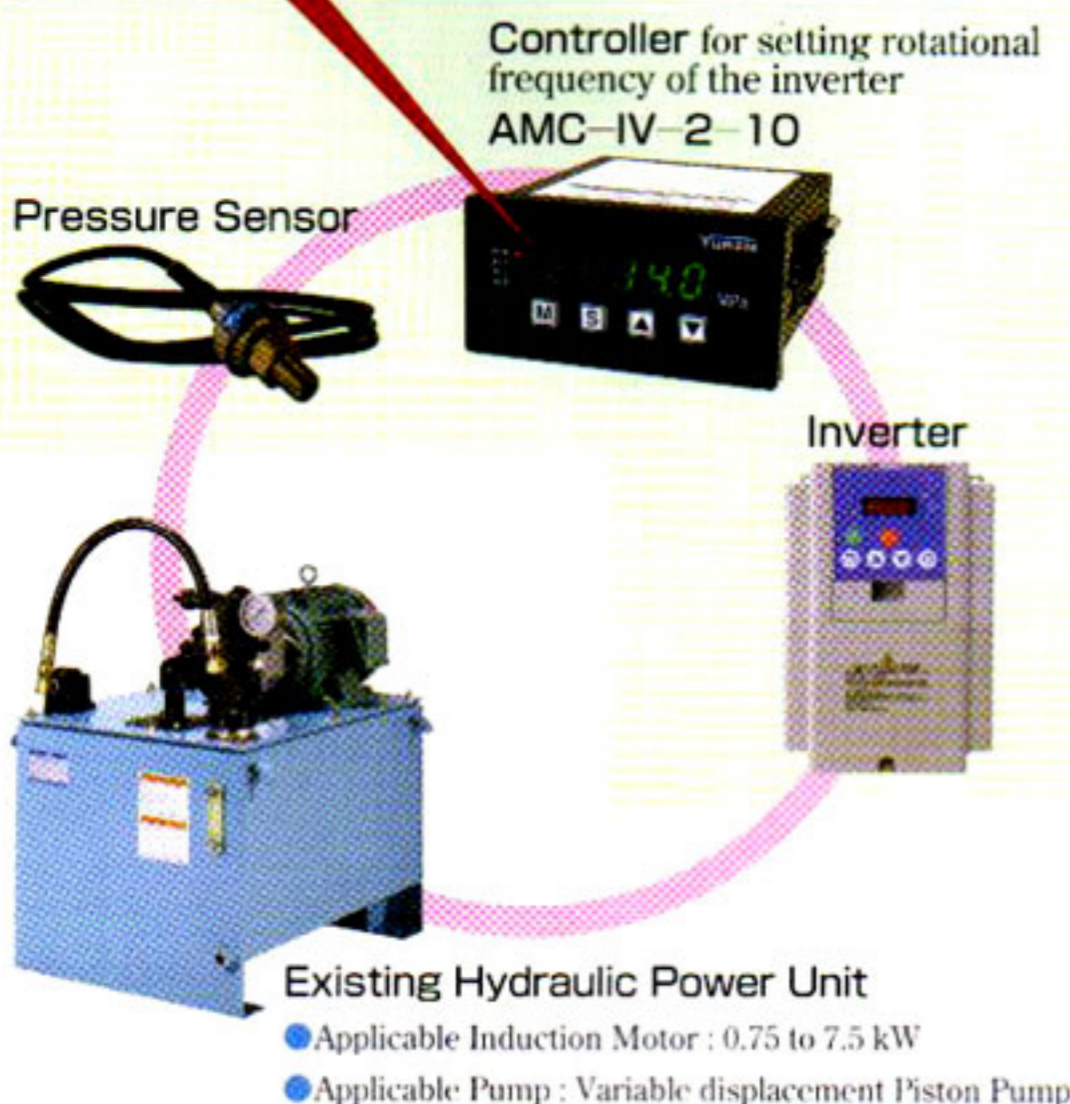
## Energy-saving control system for hydraulic units (Energy saving controller)

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.

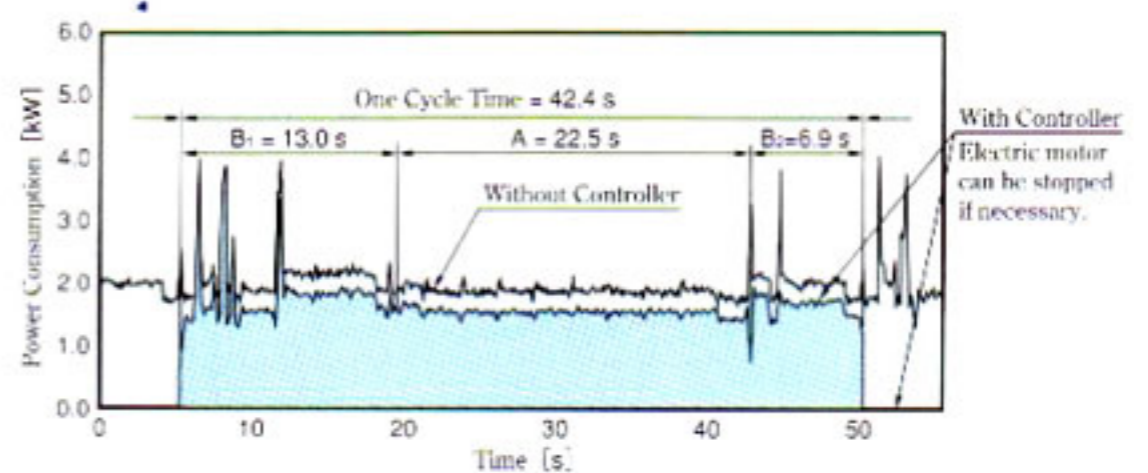
### System Configuration

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



### 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 <sub>1</sub> + B <sub>2</sub>	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

# Worldwide YUKEN Affiliated Companies and Distributors

## ARGENTINA

- **Distritec S. A.**  
Av. 85 No. 1113 (B1650HWG) San Martin,  
Buenos Aires  
Tel. 11-4754-6000  
Fax. 11-4755-9093

## AUSTRALIA / NEW ZEALAND

- **ACT Corporation (Australia) Pty. Ltd.**  
5 Woorabinda Street, Runcorn  
QLD4113, Australia  
Tel. 07-3841-5788  
Fax. 07-3841-4088

## AUSTRIA

- **Eurofluid Hydraulik GmbH.**  
Europastr. 5,  
A-3442 Tulln-Langenrohr  
Tel. 2272-66990  
Fax. 2272-66991

## BELGIUM

- **C.G.E.S. NV SA**  
Werkhuiszenkaai 155 B 19  
Quai Des Usines, 1210 Brussel  
Tel. 02-242-3720  
Fax. 02-215-3404

## BRAZIL

- **Yutec Hidraulica Ltda.**  
Rua Tiburcio de Souza, 1621,  
Itaim Paulista Sao Paulo S.P.  
CEP:08140-000  
Tel. 011-6568-6400  
Fax. 011-6568-7327
- **Hidracomp Componentes  
Hidraulicos Ltda.**  
Rua Dr. Edgard Magalhaes Noronha,  
704-704 Vila Nova York, Cep 03480-000  
Sao Paulo S.P.  
Tel. (11) 6721-1113  
Fax. (11) 6721-9302

## CANADA

- **Drive Products Inc.**  
1665 Shawson Drive, Mississauga,  
Ontario, Canada, L4W 1T7  
Tel. 905-564-5800  
Fax. 905-564-5799

## CHINA

- **Yuci Yuken Hydraulics Co., Ltd.**  
Jingwei Road 256, Yuci, Jinzhong City,  
Shanxi Province P.C. 030600  
Tel. 354-2427866  
Fax. 354-2421606  
URL <http://yuciyuken.com/>  
E-mail [xs@yuciyuken.com](mailto:xs@yuciyuken.com)
- **Hy South Tech (SHENGZHEN)  
Co., Ltd.**  
Room 2806, 28 / F., News Bldg.,  
Shennan Rd., Shenzhen 518027  
Tel. 755-82091466  
Fax. 755-82091966
- **Hy Industry (HANGZHOU) Co., Ltd.**  
19 / F Kaiser Commercial Center,  
No.11 Qingchun Rd., Hangzhou  
Tel. 571-87225088  
Fax. 571-87225066

- **Yuken Kogyo (H.K.) Co., Ltd.**  
Flat 20, 7F., Block B, Focal Industrial  
Centre, 21 Man Lok Street, Hung Hom,  
Kowloon, HONG KONG  
Tel. 2362-2355  
Fax. 2765-7612  
E-mail [yuken@yuken.com.hk](mailto:yuken@yuken.com.hk)

- **Dalian Yuken Trading Co., Ltd.**  
R/N 1803B, World Trade Center,  
No.25 Tongxing Street,  
Zhongshan District, Dalian, P.C. 116001,  
Tel. 411-39869128  
Fax. 411-39869127  
E-mail [yuken\\_dalian@yuken.net.cn](mailto:yuken_dalian@yuken.net.cn)

## Yuken Kogyo (H.K.) Service Center

- **Yuken Kogyo(Ningbo) Hydraulic  
Technology Company Limited**  
1 / F, Block D, No.143,  
Qi Xin Road, Jiangdong District,  
Ningbo City, Zhejiang Province  
Tel. 0574-87928836  
Fax. 0574-87929773  
E-mail [nbyuken@yuken.com.hk](mailto:nbyuken@yuken.com.hk)

## DENMARK

- **Hydro Service**  
Glarvester Vej 18, DK-6710 Esberg,  
Tel. 75 155855  
Fax. 75 155093

## EGYPT

- **E.M.A. Co.,**  
292 Ramsis 2 Extension Nasr City, Cairo  
Tel. 2-3865509  
Fax. 2-3865509

## FRANCE

- **DHPS Sarl**  
1 Impasse Du Jardin Renard,  
95110 Sannois  
Tel. 01-3026-2626  
Fax. 01-3025-2737

## INDIA

- **Yuken India Ltd.**  
(Head Office)  
P.B. No.16, Whitefield Road, Whitefield,  
Bangalore-560 066  
Tel. 080-28452262  
Fax. 080-28452261  
URL <http://www.yukenindia.com>  
E-mail [enquiry@yukenindia.com](mailto:enquiry@yukenindia.com)  
(New Delhi Office)  
26, Community Centre, Mayapuri,  
Phase-1, New Delhi 110 064  
Tel. 011-28115545  
Fax. 011-28115452  
(Kolkata Office)  
Indra Prastha, 46A, Madan Mohan  
Malaviya, Sarani,  
(Formerly Chakraberia Road, North),  
Ground Floor, Kolkata 700 020.  
Tel. 033-24544345  
Fax. 033-24544348  
(Mumbai Office)  
H-4 Ansa Industrial Estate,  
Saki Vihar Road, Sakinaka,  
Mumbai-400 072  
Tel. 022-28472011  
Fax. 022-28472012  
(Bangalore Office)  
B-80, 2nd Cross, 1st Phase  
Peenya Industrial Area,  
Bangalore-560 058.  
Tel. 080-28390225  
Fax. 080-28390224

## INDONESIA

- **P.T.Samudra Teknindo Hydraumatic**  
Jl. Prof. Latumenten, Hasbiban III No.35,  
Jakarta Barat 11220.  
Tel. 021-630 8889  
Fax. 021-630 8989

## IRELAND

- **Hydraulic Consultants & Service Ltd.**  
Unit 3, Ballymount Court Business Centre  
Ballymount Road, Walkinstown Dublin  
Tel. 1-4565871  
Fax. 1-4508080

## ITALY

- **Pitteri Viloini**  
20021 Baranzate Di Bollate,  
Milan Via I Maggio, 25 / 27  
Tel. 02-382209233  
Fax. 02-3561674

## KOREA

- **Yuken Korea Co., Ltd.**  
Room 210, Asia Bldg., 413-49  
Shindorim-Dong, Guro-Gu,  
Seoul 152-887  
Tel. 02-2675-2110  
Fax. 02-2675-2104

## MALAYSIA

- **Mega Engineering (M) Sdn.Bhd.**  
No.45, Jalan Perindustrian Silibin 1,  
Kawasan Perindustrian Ringan Silibin,  
30100 Ipoh, Perak  
Tel. 05-5279823  
Fax. 05-5272711

## MEXICO

- **Yukme, S. A. De C. V.**  
Zaragoza No.7, Col. Sta. Ana Tiapaltitlan  
C. P. 50160, Toluca, Edo. De Mexico  
Tel. 722-270-5282  
Fax. 722-270-9349

## NORWAY

- **A/S Hydranor**  
Withs Gate 11, N-3600 Kongsberg  
Tel. 32865656  
Fax. 32865655

## PHILIPPINES

- **L&L Optimum Commercial Corp.**  
Lot 39 Blk. 15 Basswood St.,  
Greenwoods, Pasig City  
Tel. 2-642-4895  
Fax. 2-643-9241

## POLAND

- **Masterpol**  
Przedsiębiorstwo Produkcyjno-  
Handlowe, 60-167 Poznanul,  
Olesnicka 15  
Tel. 061-8685911  
Fax. 061-8689355

## PORTUGAL

- **Fluidraulica-Eq. Hydraulicos LDA,**  
Meaes-Lousado 11, VN Famalicao,  
4760 Lousado  
Tel. 252-316215  
Fax. 252-316280

## RUSSIA

- **ZAO Enerprom-Mikuni**  
P.O. Box 718, 28  
Starokuzmikhinskaya str.,  
Irkutsk, Russia, 664033  
Tel. 3952-211-541  
Fax. 3952-255-797

## SINGAPORE

- **Taknas Engineering (Pte.) Ltd.**  
Block 6 No.102 Pandan Loop Jurong,  
Singapore 128310  
Tel. 7775856  
Fax. 67796711
- **AB Hydramec Pte. Ltd.**  
188, Tagore Lane, Singapore 787584  
Tel. 64532766  
Fax. 64539377

## SOUTH AFRICA

- **Ernest Lowe (Pty) Ltd.**  
6 Skew Road Boksburg North 1460  
P.O. Box 6357, Dunswart, 1508  
Tel. 011-8944281  
Fax. 011-8943267

## SPAIN

- **Keelavite**  
Ctra. Billabona-Asteasu, Km. 3  
Tel.943 69 27 00  
Fax.943 69 17 75

- **Servitec Industriales Tecnicos SA**  
Poligono Industrial Palmones-11  
Gondola-12 Los Barrios (Cadiz)  
11379  
Tel.05-5667-7361  
Fax.05-5667-7903

## SRI LANKA

- **Yuken India Ltd.**  
(Sri Lanka Branch Office)  
No.15, Col. T G Jayawardana Mawatha,  
Colombo 03  
Tel. 011-2564037

## SWITZERLAND

- **Oelhydraulik Hagenbuch AG.**  
Risching 1 Ch-6030 Ebikon LU  
Tel. 041-444-1200  
Fax. 041-444-1201

## TAIWAN

- **Yuken Hydraulics (T.W.) Co., Ltd.**  
(Head office)  
No.12, 7th Road, Taichung Industrial Park,  
Taichung  
Tel. 04-2359-3077  
Fax. 04-2359-8813  
URL <http://www.yuken.com.tw>  
E-mail [office@yuken.com.tw](mailto:office@yuken.com.tw)  
(Taipei Office)  
1F, No.97, Wun Ming Road,  
Guei Shan Township, Taoyuan County  
Tel. 03-328-3628  
Fax. 03-328-3242

- **San Shin Co., Ltd.**  
59 Cheng Kung Road, Tainan  
Tel. 06-223-4191  
Fax. 06-220-0218

- **Shinhsing Trading Co., Ltd.**  
No.16, Lane 313  
Fu Hsing N. Road, Taipei  
Tel. 02-2712-2190  
Fax. 02-2712-7173

## THAILAND

- **Chavanan Corporation Limited.**  
156 Sukhumvit 55 Road, Klongton Nua,  
Vadhana Bangkok 10110  
Tel. 2714-9088  
Fax. 2381-1832

## TURKEY

- **Mert Teknik Fabrika Malzemeleri Ticar  
ve Sanayi A.S.**  
Tersane Cad No.43, (34420) Karakoy-  
Istanbul  
Tel. 212-252-8435  
Fax. 212-245-6369

## UNITED KINGDOM

- **Yuken (U.K.) Ltd.**  
51 Spindus Road, Speke Hall Industrial  
Estate,  
Liverpool L24 1YA  
Tel. 0151-486-4696  
Fax. 0151-486-3537  
URL <http://www.yuken.co.uk>  
E-mail [office@yuken.co.uk](mailto:office@yuken.co.uk)
- **TWR Design Ltd.**  
The Workshop, Taylors Lane,  
Stubwood, Uttoxeter, ST14 5HU  
Tel. 01889-591581  
Fax. 01889-591580

- **East Yorkshire Hydraulics Ltd.**  
Units 4B / 4C Harpings Rd.,  
National Avenue, Hull HU5 4JF  
Tel. 01482-440222  
Fax. 01482-440225

- **Ovalway Hydraulic Engineering Ltd.**  
11, Cannon Park Road, Cannon Park,  
Middlesbrough, Cleveland, TS1 5JU  
Tel. 01642-247106  
Fax. 01642-241874

- **Highland Hydraulics Ltd.**  
Unit 1 Dalcross Ind. Est,  
Inverness Airport, Inverness IV2 7JB  
Tel. 01667-462292  
Fax. 01667-462922

- **JCP Hydraulics**  
D1 Laser Quay, Culpepper C1.,  
Medway City Est., Rochester ME2 4HU  
Tel. 01634-725554  
Fax. 01634-725558

## U.S.A. / CANADA

- **ALA Industries, Ltd.**  
1150 Southpoint Dr. Suite-D  
Valparaiso, IN 46385 U.S.A.  
Tel. 219-465-4197  
Fax. 219-477-4194  
E-mail [ala@yuken.org](mailto:ala@yuken.org)

## Yuken North American Service Center

- **Servo Kinetics, Inc.**  
3716 Plaza Drive Ann Arbor MI  
48108 U.S.A.  
Tel. 734-996-4996  
Fax. 734-668-6630

- **Bear Fluid Power**  
34612 Centaur Clinton Township,  
MI 48035, U.S.A.  
Tel. 586-792-2800  
Fax. 586-792-2882

## VIET NAM

- **Thang Long Tech Co., Ltd.**  
82 Le Thnh Nghi Str,  
Hai Ba Trung Dist, Hanoi  
Tel. 4-623-0117  
Fax. 4-623-0116  
E-mail [tkd@hn.vnn.vn](mailto:tkd@hn.vnn.vn)

- **Thuy-Khi-Dien R.T.**  
165 / 40 Nguyen Thai Binh Str.,  
Dist 1, HCM City  
Tel. 8-8218613  
Fax. 8-8218614  
E-mail [tkd-rt@hn.vnn.vn](mailto:tkd-rt@hn.vnn.vn)

■ Affiliated Company ● Distributor

## YUKEN KOGYO CO., LTD.

Overseas Sales Department (Tokyo office) :

Hamamatsucho Seiwa Bldg., 4-8, Shiba-Daimon

1 Chome, Minato-ku, Tokyo 105-0012, Japan

Telephone: 81-3-3432-2110

Facsimile: 81-0-3436-2344

URL <http://www.yuken.co.jp>

E-mail [int.bd@yuken.co.jp](mailto:int.bd@yuken.co.jp)

Hydraulic Equipment

July 1992 1st Edition  
July 2000 Revised Edition 2  
June 2007 Revised Edition 3



Distributor or Agent