

YUKEN: Hydraulic Equipment

Yuken Hydraulics



FRIENDLY • INTELLIGENT • POWERFUL • HYDRAULICS



YUKEN PRODUCTS FOR EVERY NEED

As a specialized manufacturer of hydraulic equipment, we Yuken are 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 just to introduce the line up of our products. Therefore, the guide does not present the detailed technical information such as dimensions, specifications and characteristics of each and every product. If you require such information, please request us or our sales representatives for the Engineering Information Catalogue or Product Catalogue prepared separately.



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Fukuroda Factory



Sagami Factory

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PROPORTIONAL ELECTRO-HYDRAULIC CONTROLS

ASSOCIATED PRODUCTS

[Affiliated Companies]

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Variable Displacement Piston Pumps

AR

Series Variable Displacement Piston Pumps

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

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





Series Variable Displacement Piston Pumps

With the well-known low noise level and a new addition of A70, A90 and A145 pump versions having the maximum pressure upto 28MPa, A series pumps have much more extensive coverage in their line up and specifications.

Ten control types are available ranging from pressure compensator control to proportional electro-hydraulic pressure/flow control.



ALH

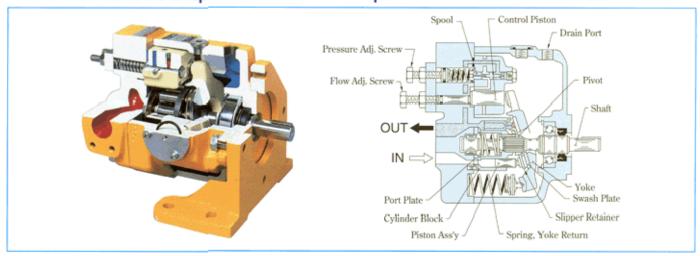
Series Variable Displacement Piston Pumps

AH series are variable displacement piston pumps of high pressure, high efficiency, high speed and low noise developed by 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.



	Pump Type	Maximum Operating Pressure MPa	Geometric Displacement cm³/rev 1 2 5 10 20 50 100 200 300
٧	"AR" Series 'ariable Displacement Piston Pumps	16	AR16 AR22
		21	A10 A16
Sd		16	A22
ston Pum	Single Pumps	21	A37 A56
"A" Series Variable Displacement Piston Pumps		28	A70 A90 A145
able Dis	Double Pumps	28	Outboard Pump A16 A22 A37 A56 Inboard Pump A16 A22 A37 A56 A70 A90 A145 (Driven End)
Var	Variable / Fixed Double Pumps	28	Outboard Pump RV2R1 RV2R2 Inboard Pump A16 A22 A37 A56 A70 A90 A145 (Driven End)
٧	"AH" Series 'ariable Displacement Piston Pumps	31	AH16 AH37 AH56

"A" Series Variable Displacement Piston Pumps

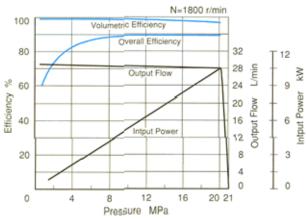


Features

High efficiency

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

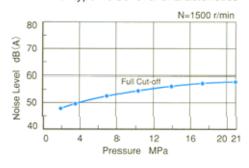
"A16" type performance characteristics



Low noise level

In A16 pump, the noise level 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		Pressure	"05" Two-Pressure Two-Flow Control Type by System Pres.	A 201	T GH OG CC Pt Pt Pt Pressure →
"02" Solenoid-two Pressure Control Type		SOL	"06" Two-Pressure Two-Flow Control Type with Solenoid Valve		TOTAL SOLYON' SOLYON' PL Pressure
"03" Pressure Compensator with Unloading Type		Tool SOL SOL OFF OAT Pressure →	"07" Pilot Pressure Control Type Pressure Compensator		↑ Solution Pressure → (Filet Pres.→)
"04" Proportional Electro— Hydraulic Load Sensing Type		The state of the s	"09" Constant Power Control Type		↑ Corport Flow ↑ Imput Power □ Imput Power
"04E" Proportional Electro- Hydraulic Pressure & Flow Control Type		T-assure - (S-Input Voltage-1.)	Simple Two-Pressure Two-Flow Control Type		Out and a proper of the pressure of the pressu

Vane Pumps

There is a variety of vane pumps from low-noise lowpulsation, small-capacity models to low-noise high pressure models which are available in wide range.



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 the output flow of such a wide range as from 5.8 to 237cm³/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/PV2R4:136~237cm3/rev



Noise Level

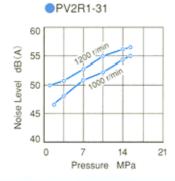
Measuring condition

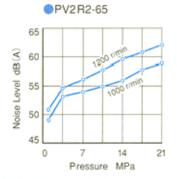
Fluid viscosity : 20mm²/s

Measurement position: One metre horizontally away from

pump head cover

Background noise : 40dB(A)





PV11R Series Vane Pumps

These pumps are durable against such a high pressure as 40MPa. The excessive wear to the vanes and camring which usually occurs in such hige pressure vane pumps has been solved by means of adopting the special methods in both mechanical construction aspects and lubrication systems.

●Model · · · · · · PV11R10, PV11R20

Max.Operating Pressure ······40MPa (Anti-Wear Type Oils)

25MPa (R&O Type Oils)

●Geometric Displacement ······PV11R10 : 2.2~12.1cm³/rev

PV11R20: 15.2~22.1cm³/rev



Pump Type	Maximum Operating Pressure MPa	Output	Flow L/min 10 20	50	min at No	200		0 800
"PVL" Series Single Pumps	5	PVL1						
Single Pumps	7		50T		150T	250F	500F	
Double Pumps	7	Small Volume	(50)		(150)	(250)		
		Large Volume	(50)	1	(150)	(250)		
Combination Pumps	7	Small Volume	(50)					
		Large Volume	(50)		(150)		1	
"PV2R" Series Single Pumps	21		PV2R1	PV2R2	PV2R3	PV2R4		
"PV2R" Series Double Pumps	21	Small Volume	(PV2R1)	(PV2R2)	(PV2R3)		
		I	arge Volume	(PV2R2)	(PV2R3	(PV2R4)		
"PV11R" Series Single Pumps	40	PV11R1	0 PV11R20					

Pressure Control Valves

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



Low Noise Type Pilot Operated Relief Valves

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



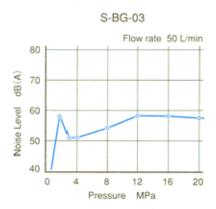
Noise Level

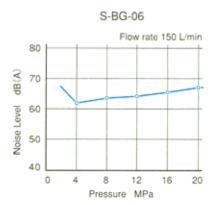
Measuring condition

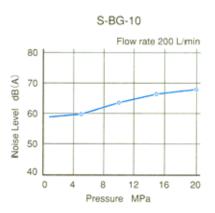
Fluid viscosity : 35mm²/s

Measuring position : At one metre back from the valve front.

Tank line back pressure : 0.1MPa



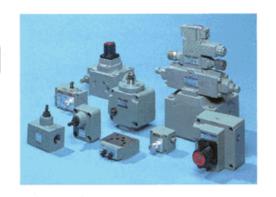




Valve Type	Maximum Operating Pressure MPa	1 2 3	5 10	Max. Flow 20 30 50		20	0 300 50	00	1000 20
Remote Control Relief Valves	25	DT -01							
Direct Type Relief Valves	21	DT/DG-	02						
Pilot Operated Relief Valves	25		I	T/BG	03	06	10	16	24
Low Noise Type Relief Valves	25		S-	BG	03	06	10		
Solenoid Controlled Relief Valves	25		BS	T/BSG	03	06	10	16	
Low Noise Type Sol. Cont. Relief Valves	25		S-	BSG	03	06	10		
Brake Valves	25	U	BGR	03	06	10			
H/HC Type Pres. Control Valves	21	HT·H	G/HCT · HCG		03 06	10	16		
Pres. Reducing & Check Valves	21	RT · R	G/RCT - RCG		03 06	10	16	-7	
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 is available.

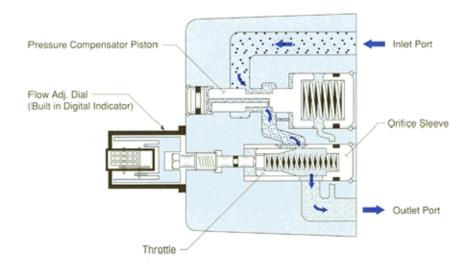


Flow Control Valves/Flow Control and Check Valves

These valves are pressure and temperature compensating type valves and maintain a constant flow rate independent of change in system pressure (load) and temperature (viscosity of the fluid). They 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	1 2 3 5 10		Flow L/1	min 200 30	0 50	0 1000 2000 3000 5000
Flow Control (& Check) Valves	21	FG/FCG 01	02	03	06	10	
Flow Control & Relief Valves	25	FBG	2327	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 -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 conforming to JOHS Standard—The Japan Oil Hydraulics Standard—are available to meet the variety in customers' needs.



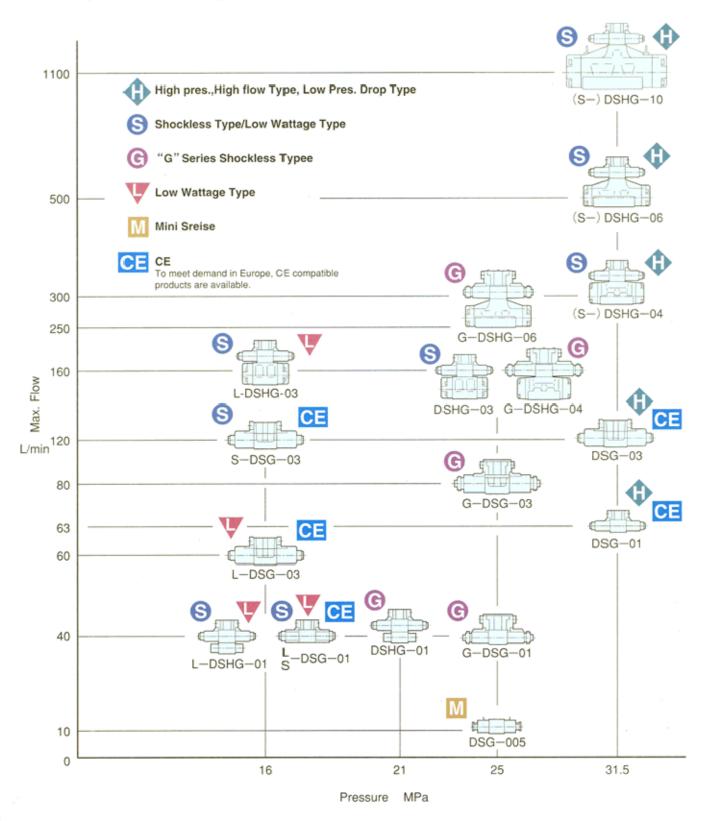
Valve Type	Maximum Operating Pressure MPa	Max. Flow L/min 1 2 5 10 20 50 100 200 500 1000 2000 5000
	25	DSG-005
Solenoid Operated Directionl Valves	31.5	DSG-01
		DSG-03
	21	DSHG-01
Solenoid Controlled Pilot Operated Directional Valves	25	DSHG-03
	31.5	DSHG 04 06 10
	21	DSHF . 10 16 24 32 (Rated Flow
"G" Series Shockless Type Directional Valves	25	G-DSG 01 03
G Series Shockless Type Directional valves	20	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
Manually Operated Directional valves	31.5	Sub-plate mountig (DMG) 01 03 04 06 10
Made significance of Direction (VI)	7	Rotary type (DR T -02) 02
Mechanically Operated Directional Valves	25	Cam operated (DC T) 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 Operated Check Valves	25	Threaded connection (CP*T) 03 06 10 (Rated Flow) Flanged connection (CP*F) 10 16 (Rated Flow)

Solenoid Operated Direction Valves / Solenoid Controlled Pilot Operated Directional Valves

This is our full range of solenoid operated and solenoid controlled pilot operated directional valves consisting of a solenoid operated directional valve and a pilot operated directional valve.

WIDE RANGE OF MODELS

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



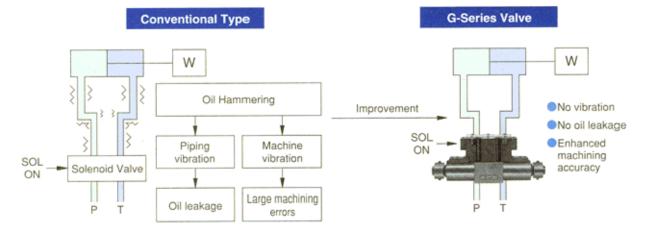
"G" Series Shockless Type Solenoid Operated Directional Valves

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

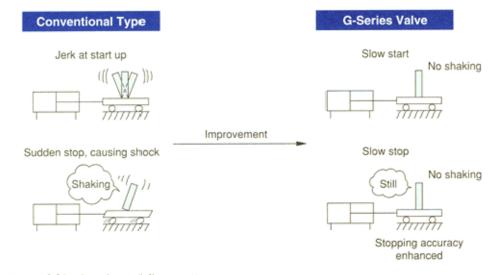
These valves with better accurate control improve the reliability of the machinery and there is less pipe leakage.

- Your valuable machines are protected from vibration and shocks
- Shocks caused by acceleration and deceleration are reduced.

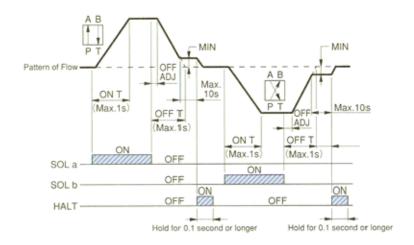




Oil hammering during spool shifting is reduced.



Relationships between SOL signals and flow patterns



Modular Valves

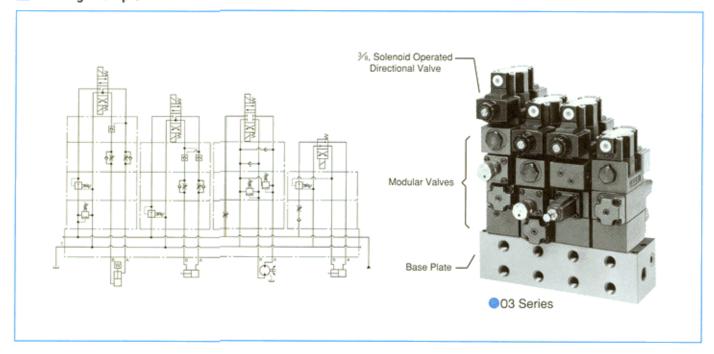
YUKEN MODULAR VALVES are designed to simplify hydraulic systems, to eliminate the use of pipe connections and thus to save space, time and costs. The modular valves have standardized interfaces (ISO 4401, CETOP, NFPA) and thickness in accordance with each valve size. Any hydraulic circuit can be composed 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 installing area and space.
- No expert skill is required to assemble, and furthermore, a supplement and a change to the circuit can easily and quickly be carried out.
- Problems such as oil leaks, vibration and noise resulting from pipes and tubes are minimized because pipes and tubes are not necessary.
- Checks and maintenance of these valves can be performed with ease because of the method of installation.





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	
01 Series Modular Valves	31.5	*
03 Series Modular Valves	25	
06 Series Modular Valves	25	
10 Series Modular Valves	25	

[★]Max Flow for Throttle and Check Modular Valves.

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

Pressure Controls

Pressure Controls		Model Numbers		Model Numbers
Name	Graphic Symbols	"005/01" Series	Graphic Symbols	"03" Series
Solenoid Operated Directional Valves	P T B A	DSG-005 DSG-01	P T B A	DSG-03
		MBP-01	**************************************	MBP-03
D.F.(Mah.havValue		MBA-01		MBA-03
Relief Modular Valves	3	MBB-01		MBB-03
				MBW-03
		MRP-01		MRP-03
Reducing Modular Valves		MRA-01		MRA-03
		MRB-01		MRB-03
				MRLP-03
Reducing Modular Valves for Low Pressure Setting	_	_		MRLA-03
Low Fressure Setting				MRLB-03
Brake Modular Valves		MBR-01	_	_
Sequence Modular Valves		MHP-01		MHP-03
Counterbalance		MHA-01		MHA-03
Modular Valves				MHB-03
	Š	MJP-01-M		
Pressure Switch Modular Valves		MJA-01-M	_	_
		MJB-01-M		

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

Flow Controls		•	Directional Control	s	
Name	Graphic Symbols	Model Numbers	Name	Graphic Symbols	Model Numbers
Flow Control Modular Valves	*	MFP-01 MFP-03		4	MCP-01 MCP-03
		MFA-01-X MFA-03-X		\\	MCA-03
		MFA-01-Y MFA-03-Y	Check Modular Valves	\ \ \ \ \ \ \ \ \ \ \ \ \ \	MCB-03
Flow Control and Check Modular	*	MFB-01-X MFB-03-X		\\	MCT-01 MCT-03
Valves	*	MFB-01-Y MFB-03-Y		+	MCPT-03
		MFW-01-X MFW-03-X	Anti-Cavitation Modular Valves	*	MAC-01 MAC-03
		MFW-01-Y MFW-03-Y		•	MPA-01 MPA-03
T	*	MSTA-01-X MSTA-03-X	Pilot Operated Check Modular Valves	•	MPB-005 MPB-01 MPB-03
Temperature Compensated Throttle and Check Modular Valves	₹	MSTB-01-X MSTB-03-X		b b	MPW-005 MPW-01 MPW-03
wodular valves	€# #è	MSTW-01-X MSTW-03-X	Modular Plates and	l Mounting Bolts	
Throttle Modular Valves	*	MSP-01 MSP-03	Name	Graphic Symbols	Model Numbers
	*	MSCP-01 MSCP-03	D 101	TITI	MDC-01-A MDC-03-A
	**	MSA-01-X MSA-03-X	End Plates	TTTT	MDC-01-B MDC-03-B
	**	MSA-01-Y MSA-03-Y			MDS-01-PA
	· •	MSB-01-X MSB-03-X	Constitution Discontinue		MDS-01-PB
Throttle and Check Modular Valves	() ()	MSB-01-Y MSB-03-Y	Connecting Plates		MDC-01-AT
	₩ ₩	MSW-005-X MSW-01-X MSW-03-X			MDS-03
	(A	MSW-005-Y MSW-01-Y MSW-03-Y	Base Plates		MMC-005 MMC-01 MMC-03
	(A P	MSW-01-XY	Bolt Kits		MBK-005 MBK-01 MBK-03
	₹	MSW-01-YX			

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	P T Y X B A	DSHG-06 DSHG-10
		MRP-06 MRP-10
Reducing Modular Valves		MRA-06 MRA-10
		MRB-06 MRB-10



005 Series

Flow Controls

Name	Graphic Symbols	Model Numbers
		MSA-06-X
		MSA-10-X
		MSA-06-Y
	₩ 1	MSA-10-Y
	[] [d.]	MSB-06-X
Throttle and Check	() ()	MSB-10-X
Modular Valves	T de l	MSB-06-Y
	연# ·	MSB-10-Y
	T	MSW-06-X
		MSW-10-X
	T	MSW-06-Y
	₩ ₩	MSW-10-Y



01 Series MSW-01



03 Series MPW-03

Directional Controls

Name	Graphic Symbols	Model Numbers
	• • • • • • • • • • • • • • • • • • •	MPA-06 MPA-10
	6	MPA-06*-*-X MPA-10*-*-X
	6	MPA-06*-*-Y MPA-10*-*-Y
Pilot Operated Check Modular Valves	<u> </u>	MPB-06 MPB-10
	o o	MPB-06**-*-X MPB-10**-*-X
	6	MPB-06*-*-Y MPB-10*-*-Y
	\$	MPW-06 MPW-10
Mounting Bolt Kits		MBK-06 MBK-10



06 Series MPW-06



10 Series MSW-10

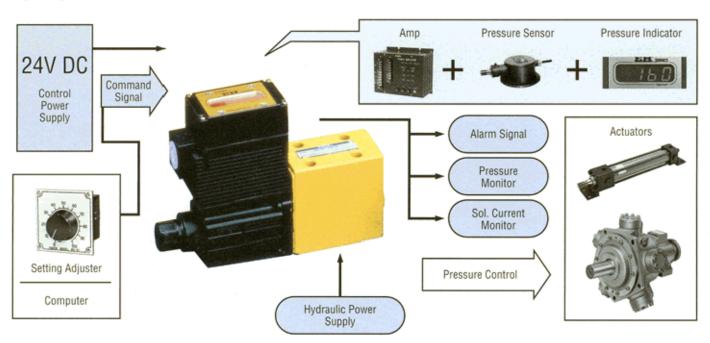
Proportional Electro — Hydraulic Controls

B Series Proportional Electro-Hydraulic Control Valves

These EH Series are compound products of hydraulic equipment using the latest electronic and sensor technology based on the reputable E Series proportional electro hydraulic controls. We have realized epochmaking easily usable hydraulic equipment with high precision and reliability by unifying amplifier, sensor, digital data indicator which are required for proportional or servo control system into valves, and making them compact.

- Just preparing the power source(DC) for controls and command signals in addition to hydraulic source, you can easily structure proportional control system or servo system.
 Amplifiers exclusively used for the system or electric control panels separately installed are unnecessary.
- By using built-in sensors;
- Pressure, orifice openness which can be converted to flow rate can be detected and controlled remotely.
- (2) As well as a compound amplifier, closed loop system can be structured.
- (3) Sensor output signals or deviation signals at structuring closed loop system can be monitored.
- Such disadvantages as 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

The 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	1 2	3 5	Max. Flow 10 20 30	L/min 50 100	200 3	00 50	0 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 (10ΩSeries)		03	06		
Flow Control & Relief Valves		EFBG (40Ω-	-10Ω Series)		03	06	10	
	24.5	EFBG (10Ω-	-10Ω Series)		03	06	10	
		EFBG (High	Flow Series)			03	06	
Directional & Flow Cont. Valves	24.5	EDFHG			03 0	4 06		

Note) Power amplifiers and setting adjusters are also available.



Pilot Relief Valve



Flow Control & Check Valve



Flow Control & Relief Valve



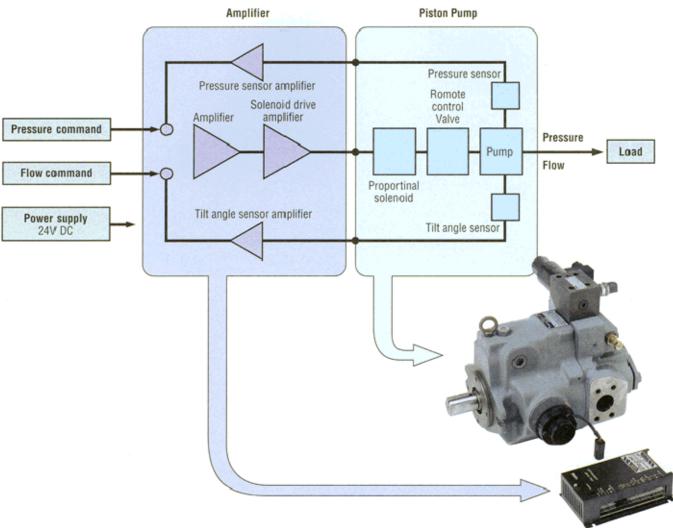
Relief Valve



Reducing & Relieving Valve

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

The pumps with 04E control type have been enjoying 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 that of EH series variable displacement pumps and to meet the customers requirements for digital control. They provide such a wide range of displacement capacities as from 15.8 to 145 cm³/rev.



Specifications

Model Numbers Displa	Geometric Displacement			Max.Shaft Speed	Max.Flow at 1800r/min	Hysteresis	Repeatability	Input Signal	Supply Electric
	cm³/rev	Rated	Intermittent	r/min	L/min				Power
A16 — # R04E	15.8	16	21	600~1800	28.4	Less than	Less than	Max.Flow/ 5V DC Specified Contorol 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				

Associated Products

Training System for Oil Hydraulics

- Functions and performance
 - You will learn the functions and performance of basic hydraulic systems and / or components such as hydraulic pumps and control valves.
- Electro-hydraulic equipment
 You will learn how hydraulic equipment are controlled by computers, sequence controllers, etc.
- You can experience the dynamic power and control of hydraulics.

Most of the training kits on the market use low pressure and low pressure scale models for trainees to learn the characteristics and / or control of hydraulic equipment. However, you will note with these training kits you can not feel or obtain any reality of hydraulic power and control.

Only with our HTU-300 series training kits, you can learn and feel the real hydraulic power and control by using weights of 150 kg, to create a load.



HTU-300 series

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