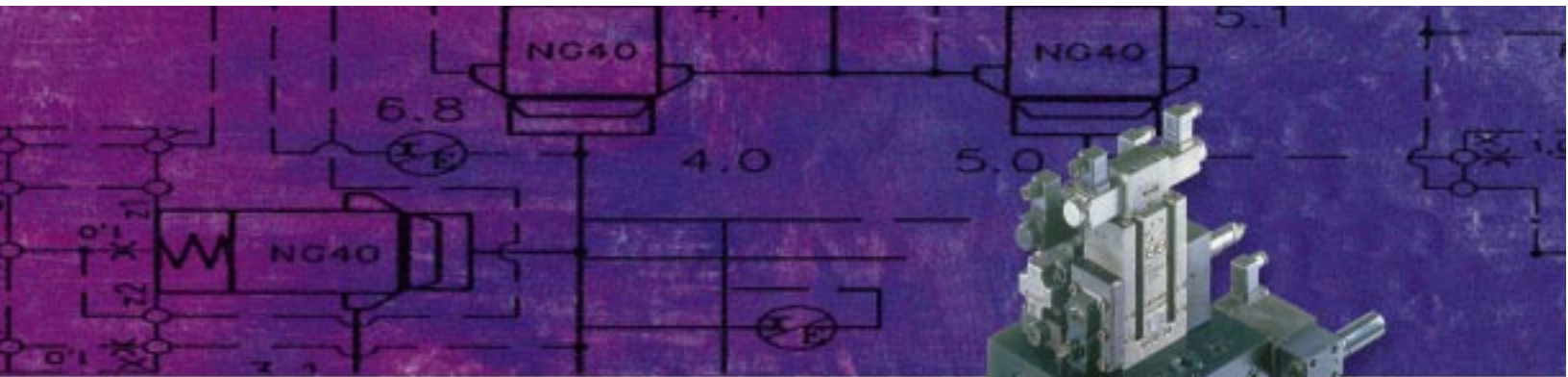


MOOG

HYDROLUX

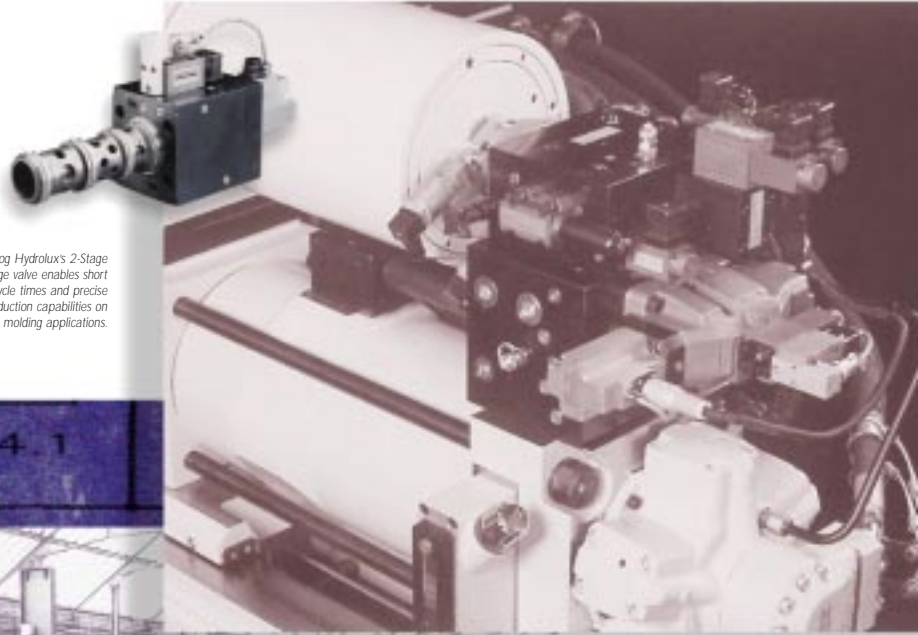
Integrated Hydraulic Manifold Systems



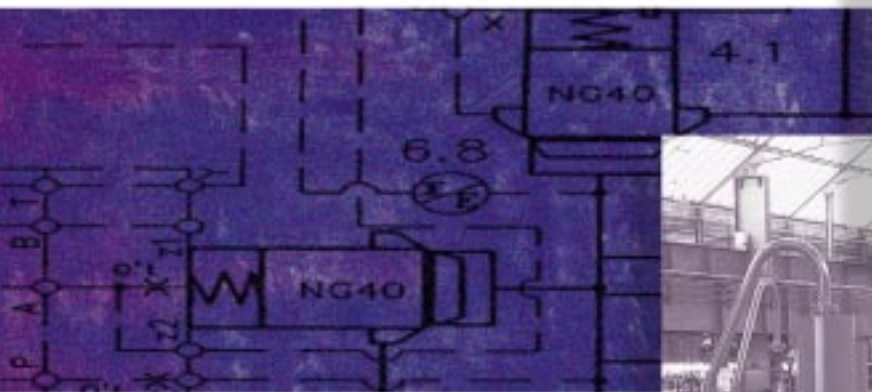
Manifold Systems *Introduction*

I H M S

After working with several key customers and understanding their needs for complete systems and sub-systems, Moog Hydrolux has taken advantage of several opportunities to integrate forward into Integrated Hydraulic Manifold Systems (IHMS) or Hydraulic Integrated Circuits (HIC). These new products are fully integrated, self contained systems that are created for each customer and application.



The Moog Hydrolux's 2-Stage Servo-Cartridge valve enables short cycle times and precise reproduction capabilities on injection molding applications.



The circuit logic and functionality can be changed to meet a customer's exact performance, safety and mounting requirements. Moog's philosophy permits a wide variety of machine control approaches in environments where pressures of 5,000 psi are commonplace.



Flexibility, low pressure drop and reduced valve response time allow Moog Hydrolux's Pressure Control Valves to assist in shear and press applications.

Moog Hydrolux's Flow Regulating Proportional Directional Valves are ideal for dynamic applications such as aircraft elevation.



Manifold Systems *Features*

IHMS' supplied by Moog Hydrolux utilize both standard and custom hydraulic valving to achieve the performance desired by our customers. Integration of our servo-proportional and high flow cartridge valves provide an increased flow capacity for comparable DIN sized cavities. When available hydraulic real-estate is at a premium, our "House Norm" cartridges allow Moog to offer the absolute smallest integrated hydraulic package available throughout the industry.

System Attributes

Integrated Hydraulic Manifold Systems offer many advantages. Reduced size, weight and cost are most obvious. Our high quality systems provide a cleaner, leak free and more reliable solution to our customers most difficult control system problems.

Integration & Test

The fully integrated features of our IHMS makes their installation simple. Eliminated are subplate manifolds, hard or flexible piping, connectors and clamps, all previously associated with distributed systems.

After a Moog Hydrolux IHMS has been installed, start-up can follow immediately. Because of our 100% testing of each and every system at our facility, "start-up anomalies" have been virtually eliminated.

Fabrication

Essential to our strategy of providing low cost, high quality manifolds is our multiple pallet CNC machining center. With the capability of holding 120 tools, these machining centers provide cost effective solutions for "one-off" requirements.



Design

Staffing our manifold and system design groups are a team of highly skilled engineers, employing the latest CAD equipment. When combined with proprietary manifold design software, Moog Hydrolux creates an efficient environment for new designs, timely quotations and unequaled customer support.

Manifold Systems Valves

DIN Standard

- 2/2 Way Slip-in Cartridge
- Size 16, 25, 32, 40, 50, 63, 80, 100, 125, 160 mm
- Flow Range 40-6,300 gpm [160-24,000 l/min]



DIN Standard high flow

- 2/2 Way Slip-in Cartridge
- Size 16, 25, 32, 40, 50, 63, 80, 100 mm
- Up to 53% Higher Flow
- Flow Range 85-3,355 gpm [325-12,700 l/min]



Check Valve

- 2/2 Way Slip-in Cartridge
- Size 10, 15, 30, 40, 50 mm
- Flow Range 21-530 gpm [80-2,000 l/min]



Directional Control

- Size D03 and D05
- Wet Pin, Long Life Solenoid
- Optimized Flow Paths for Minimal Pressure Drops



Directional Control Pilot Operated

- Size D05, D07, D08, D10
- 2-Stage Design
- Flow Range 37-400 gpm [140-1,500 l/min]
- Pressure Range to 5,000 psi



Proportional Directional

- Size D05, D07, D08, D10
- 2-Stage Design
- Flow Range 37-400 gpm [140-1,500 l/min]
- Pressure Range to 5,000 psi



- Size D05, D07, D08, D10
- 2-Stage Design
- Flow Range 37-400 gpm [140-1,500 l/min]
- Pressure Range to 5,000 psi



- Size D05, D07, D08, D10
- 2-Stage Design
- Flow Range 37-400 gpm [140-1,500 l/min]
- Pressure Range to 5,000 psi



- Size D03, D05, D07, D08, D10
- 1, 2, and 3 Stage Designs
- Flow Range 1-400 gpm [4-1,500 l/min]
- Pressure Up To 5,000 psi

Manifold Systems

Accessories

Electronics

- > Amplifier Cards
- > Snap-in Modules
- > Housed Amplifier Cards Available
- > Mating Connectors



Prefill Valves

- > Size 80 mm
- > 5,000 psi Design
- > Low Pressure Drop



- > DIN Sizes 16-100 mm
- > Sizes 15-50 mm "House Norm"
 - > Stroke Limiter
 - > Pilot Operated Check Valve
 - > Shuttle Valve
- > Connection for Directional Control Valves



- > Sizes 16-20 mm
- > Screw-in Design
- > Flow to 80 gpm [300 l/min]
- > 12V, 16V and 24V Configurations



- > DIN Sizes 16-100 mm
- > Integral Active Cartridge
 - > Built-in Limit Switch
- > Size 15-50 mm "House Norm" Available



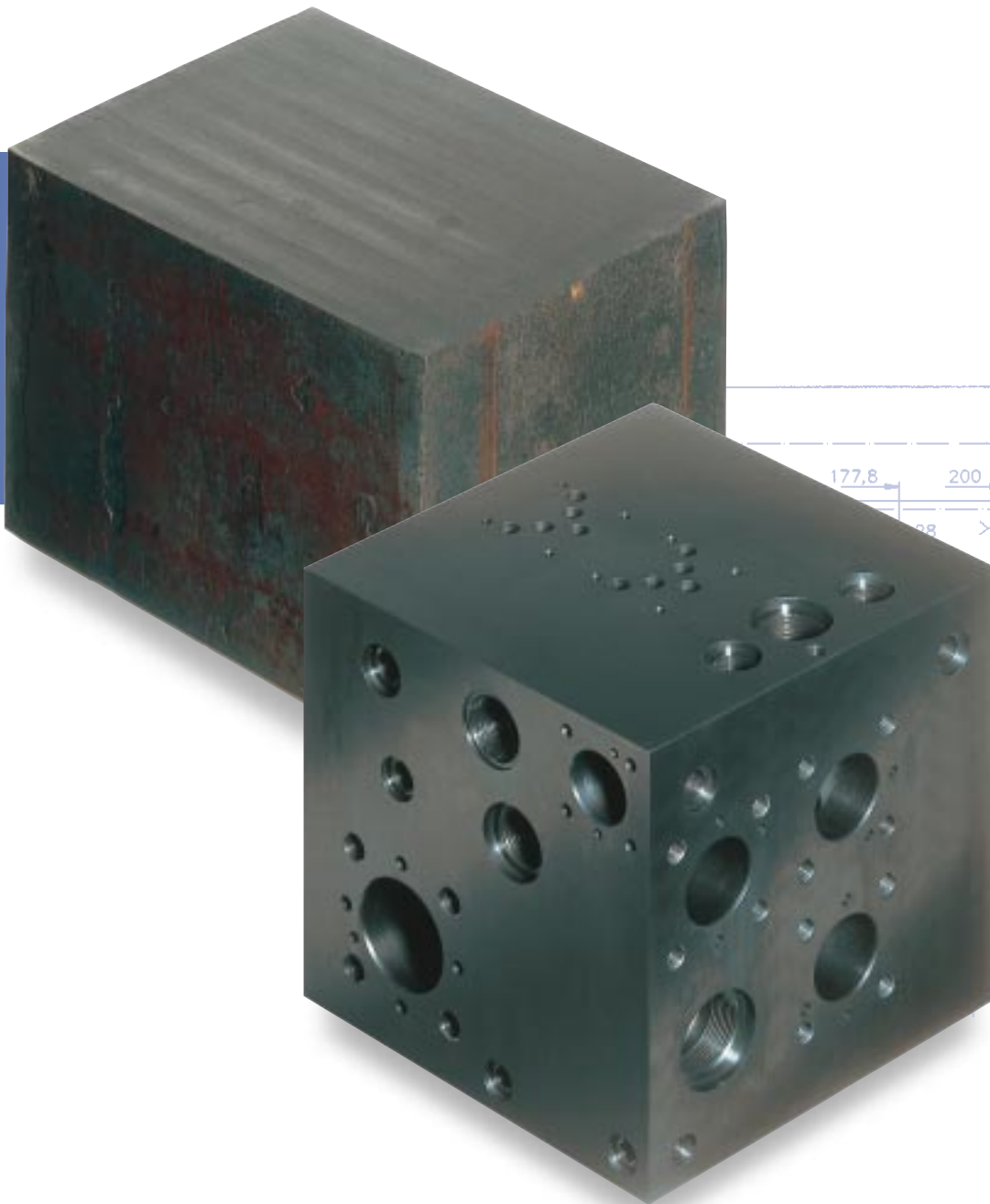
Evolution

The following pages profile the build up of an Integrated Hydraulic Manifold System, with special emphasis on the componentry used in a typical system. ➤

Manifold Systems

The Beginning

- > Customized Designs For Individual Applications
- > CAD System Designs using Proprietary Manifold Design Software
- > Wall Thickness Control
- > Volumetric Flow Area Calculation
- > Utilization of Standard and Custom Components
- > System Modeling and Performance Capabilities



Manifold Systems

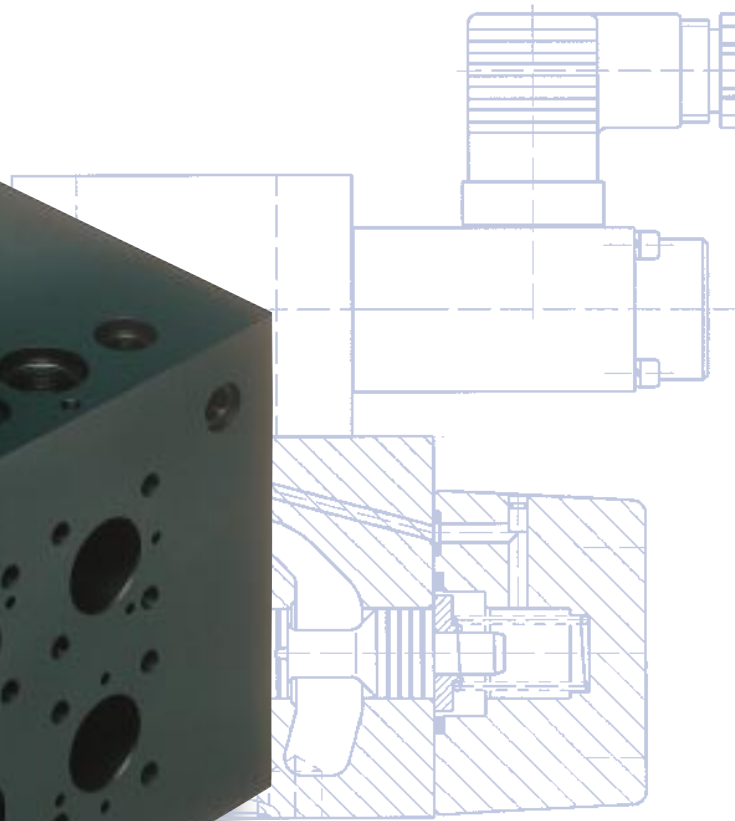
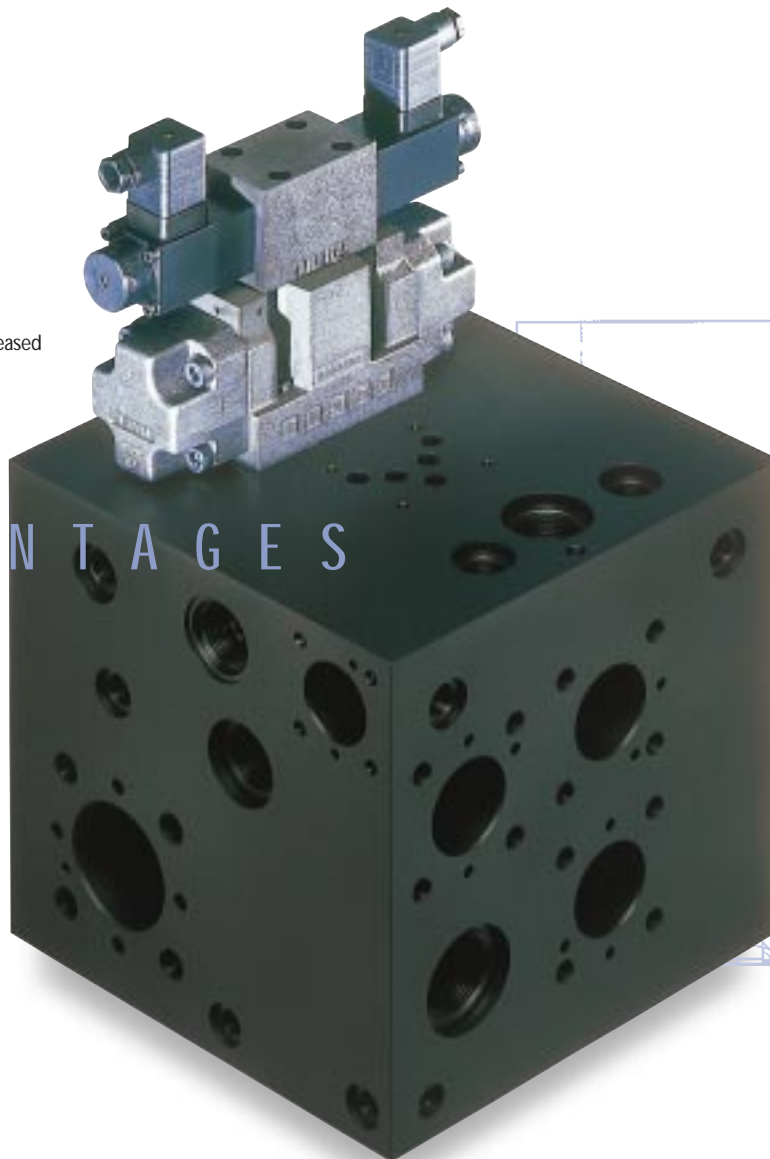
Directional Control Valves

TYPES

- Directional Control Valves
- Directional-Proportional Control Valves
- Servo-Proportional Control Valves
- Servovalves

- Extremely broad selection of valve configurations and features
- Higher flow rates for increased positioning speeds
- Faster valve response for greater levels of control

ADVANTAGES



Manifold Systems

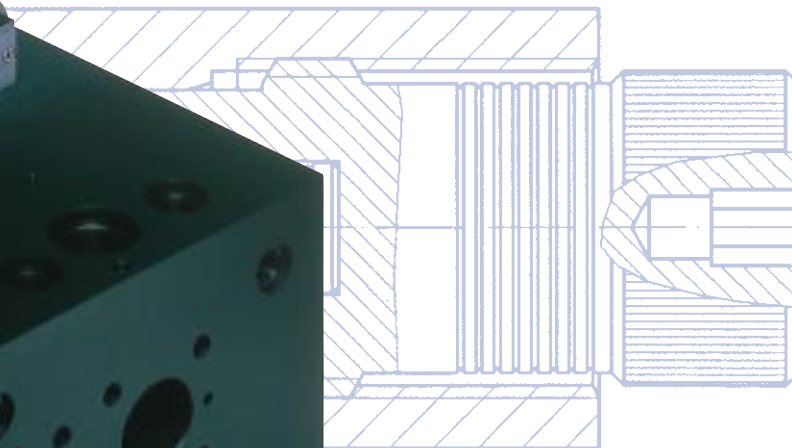
Sandwich Valves

TYPES

- > Check and Non-Return Valves
- > Flow Control Valves
- > Pressure Valves

ADVANTAGES

- > Problem free operation with other complementary valves



Manifold Systems

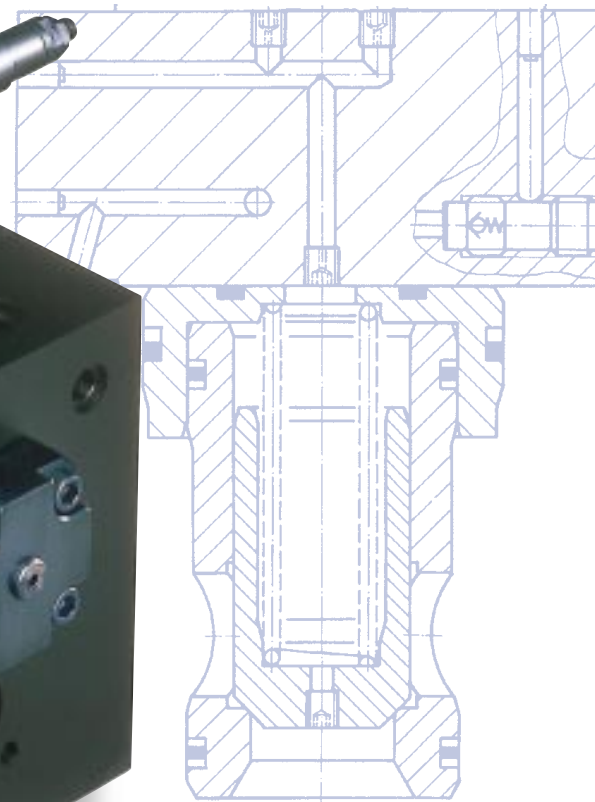
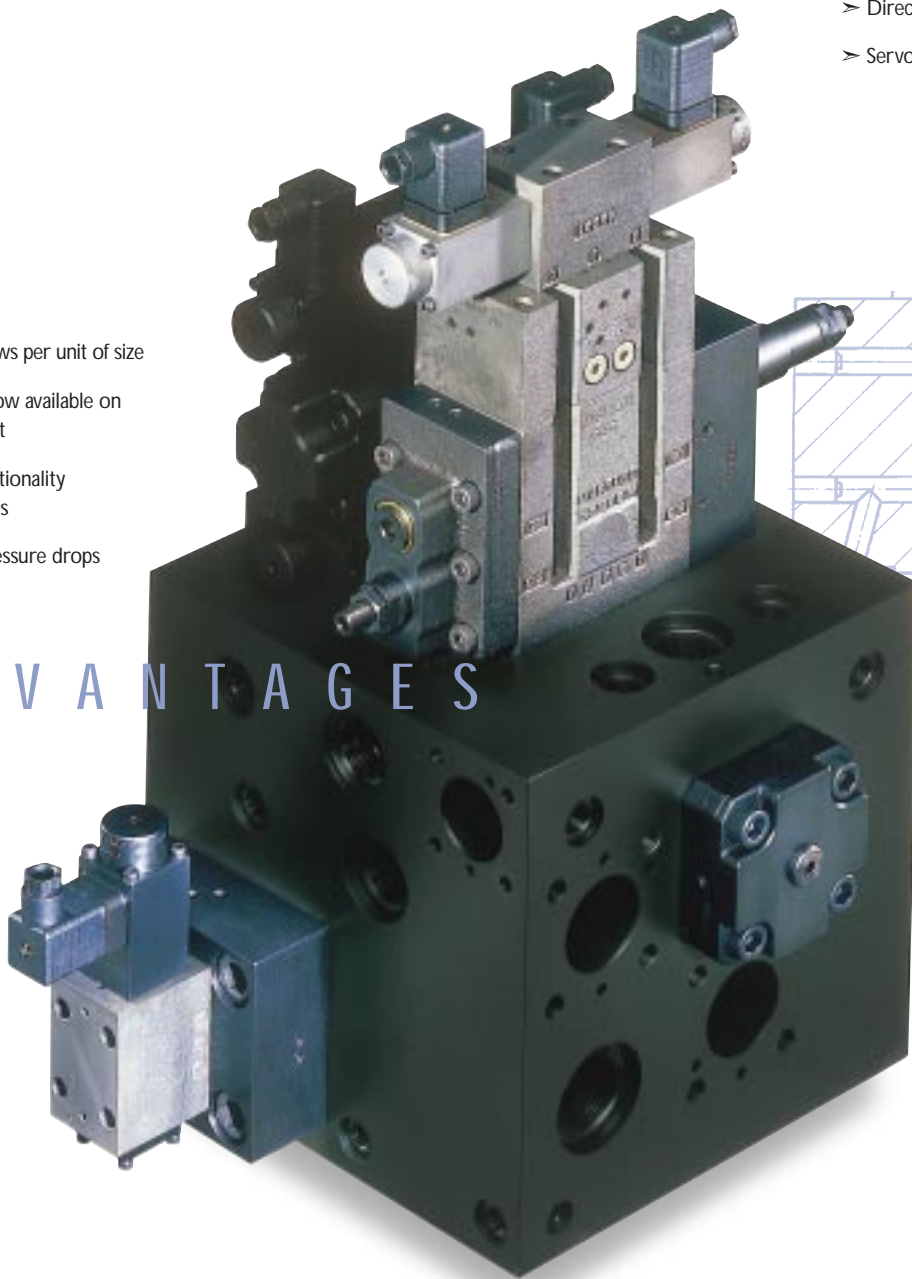
Cartridge Valves

TYPES

- > Pressure Control Valves
- > Pressure Relief Valves
- > Pressure Reducing Valves
- > Pressure Unloading Valves
- > Pressure Sequencing Valves
- > Directional Control Valves
- > Servo-Cartridge Valves

- > Higher flows per unit of size
- > Highest flow available on the market
- > Multi-functionality possibilities
- > Lower pressure drops

A D V A N T A G E S



Manifold Systems

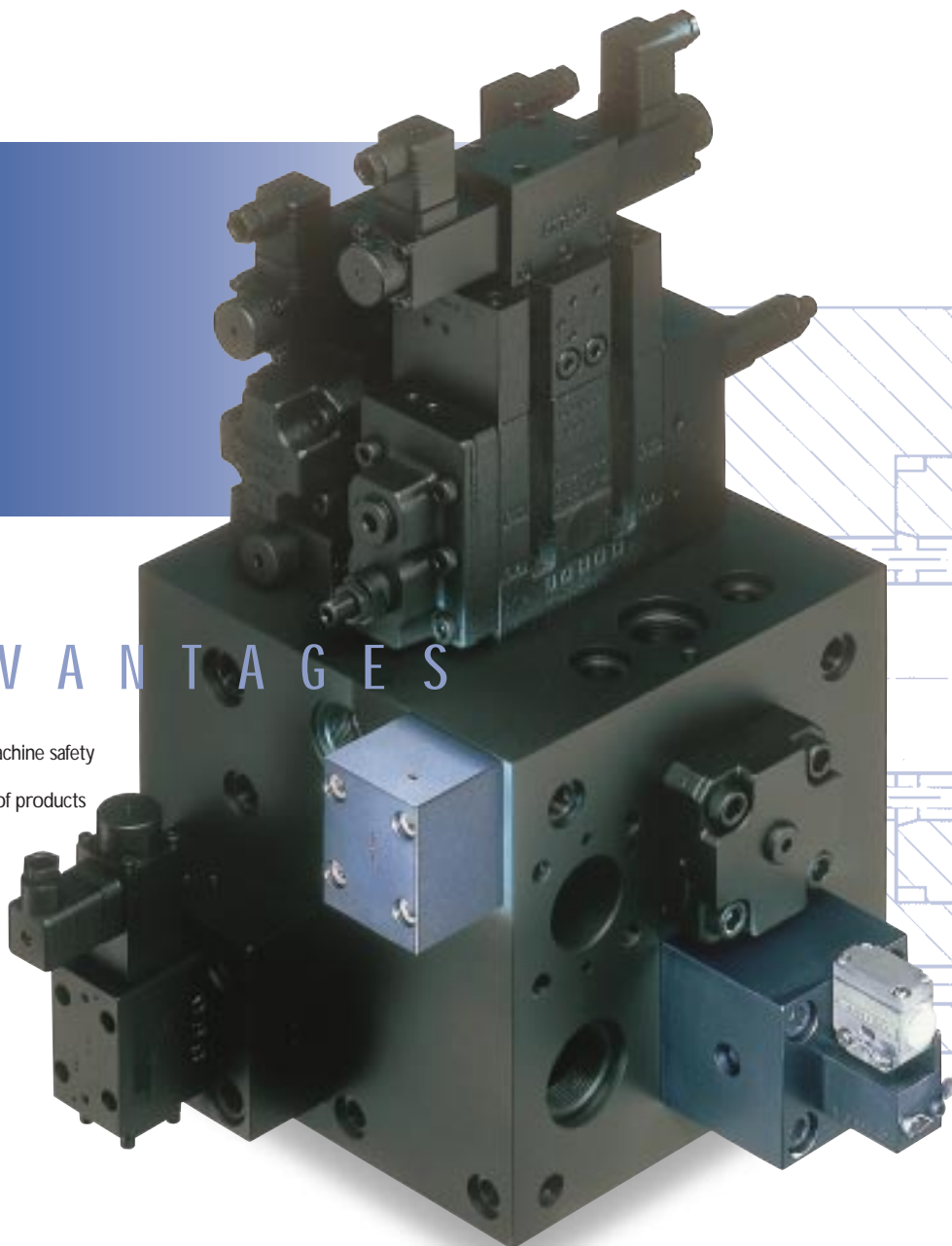
Check & Non-Return Valves

TYPES

- > Check Valves
- > Safety Gate Valves

ADVANTAGES

- > Increased machine safety
- > Wide range of products



Manifold Systems

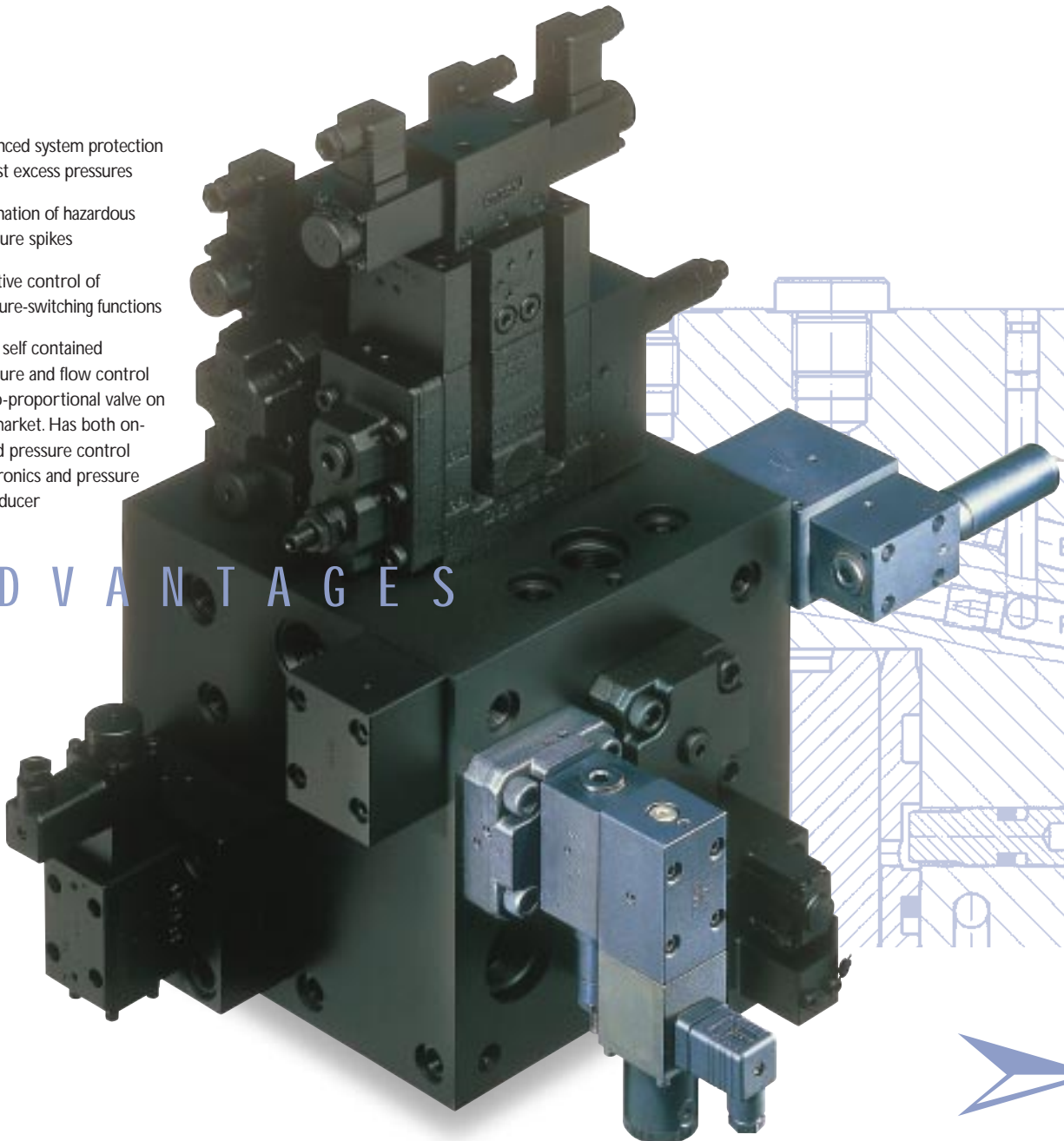
Pressure Valves

TYPES

- > Pressure Relief Valves
- > Pressure Reducing Valves
- > Pressure Control Valves
- > Sequence and Unloading Valves
- > PQ Servo-Proportional Valves

- > Enhanced system protection against excess pressures
- > Elimination of hazardous pressure spikes
- > Effective control of pressure-switching functions
- > Only self contained pressure and flow control servo-proportional valve on the market. Has both on-board pressure control electronics and pressure transducer

ADVANTAGES

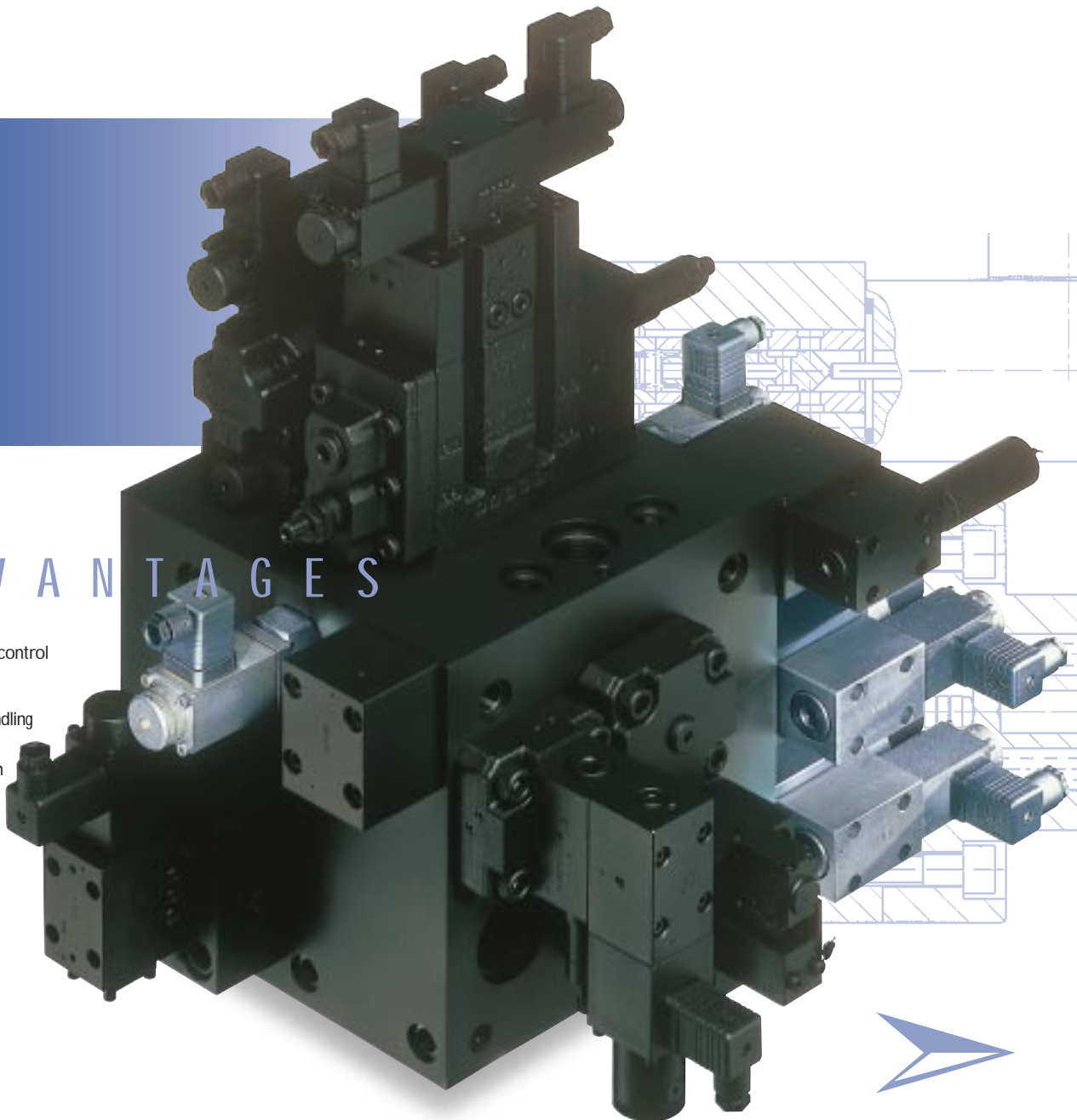


TYPES

- > Flow Control Valves with Manual Adjustment
- > Flow Control Valves with Check Valves
- > Proportional Flow Control Valves
- > Flow Regulating Valves with Pressure Compensation

ADVANTAGES

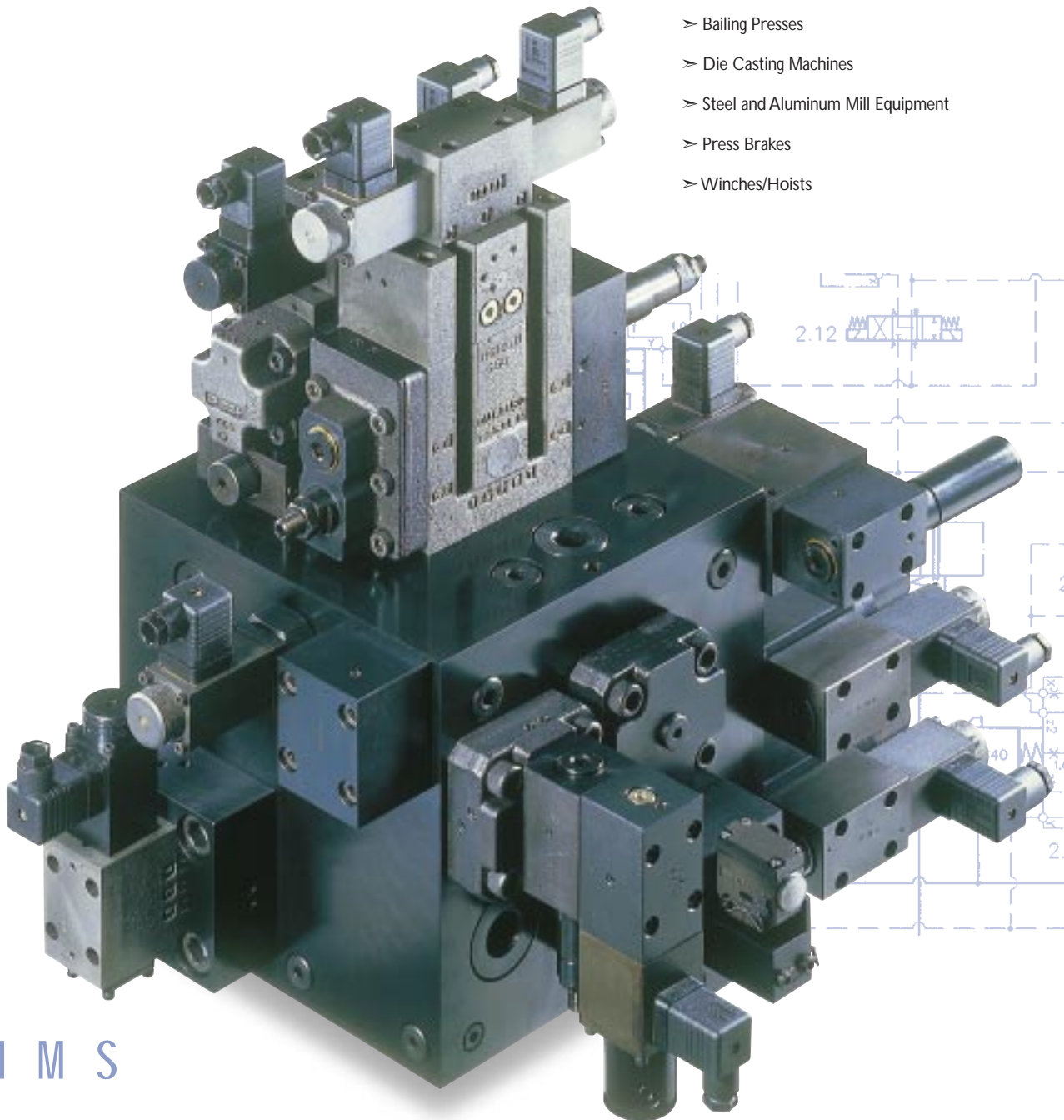
- > Cost effective control of velocity
- > Capable of handling demands associated with synchronous operation and dynamic applications



Manifold Systems *The End Result*

Typical Applications:

- > Injection Molding Machines
- > Blow Molding Machines
- > Presses
- > Shears
- > Baling Presses
- > Die Casting Machines
- > Steel and Aluminum Mill Equipment
- > Press Brakes
- > Winches/Hoists

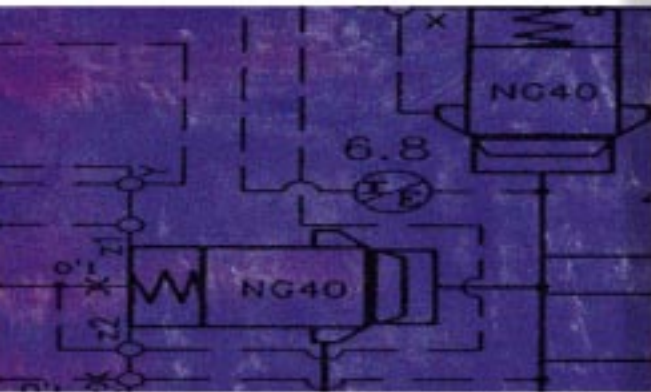


I H M S

Manifold Systems Applications

Enhanced machine performance demands efficient designs. Value-added designs come from having the proper components and the “know-how” associated with integrating those components into a high performance system.

E F F I C I E N C Y



Moog Hydrolux valves, with integrated electronics, create an efficient system like this injection molding operation above.

control electronics and control software are a necessary part of ensuring proper machine sequencing and response.

Our D660 series Servo-

Proportional valves, with integrated closed loop position control of



functional, cost effective and compact solution to today's need for enhanced motion control.

Design

The final element required for value-added motion control solutions is leading-edge systems design. What is leading edge system design? It is the know-how associated with minimizing pressure drop, reducing envelope size, increasing positioning accuracy or increasing positioning speeds. An example of what proper system design can do for a customer is the work done for a leading supplier of high performance injection molding machines. The new control system designed for this customer resulted in a simpler hydraulic system, lower integration costs and reduced control system pressure drop for improved energy efficiency.

Manifold Systems *Applications*

Systems and application know-how are the true value creator factors. The unique solutions created by Moog Hydrolux have been derived from a global perspective. Moog and Moog Hydrolux have spent over 30 years creating applications and systems innovations in practically every fluid power market. Whether you need increased positioning speeds, enhanced positioning accuracy, reduced energy consumption or lower system costs, we have the expertise necessary to provide a solution.



Moog Hydrolux Check Valves assure precision motion control on such applications as this gravitation simulator.



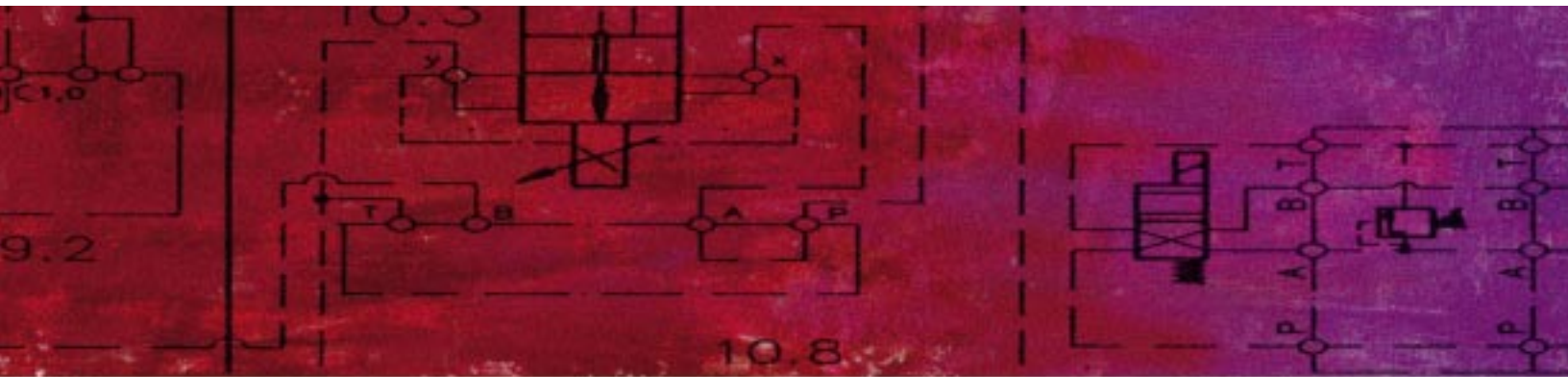
Offshore applications utilize Moog Hydrolux Pressure Control Valves for protection against excess pressure and overloading.

S O L U T I O N S

Moog and Moog Hydrolux's extensive global network of sales, engineering and service facilities, located in every corner of the world, allow us to offer unparalleled support. In addition, our strong market presence gives us unique access to many of the worlds largest OEMs. Any way you add it up, Moog Hydrolux's extensive systems and applications know-how allows us to offer you true value.



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