

Sun Hydraulics

PRODUCTS & SERVICES OVERVIEW

ADVANCED
MOTION CONTROL



A HELIOS TECHNOLOGIES COMPANY

About Sun Hydraulics

Can a manufacturing company inspire confidence in the heart of its customers?

We think so.

And we have made it our pursuit, our passion.

Each day it inspires us to be inventive, courageous, thoughtful.

Over the last 50 years, we've been putting ingenuity before conventional thinking, expressed in the factory and in the field.

Using technology to enhance our touch, not replace it, and to create confidence.

Confidence that grows stronger every time you use our products to move your business forward, or upward, or in any direction.

This is how Sun Hydraulics develops
Advanced Motion Control.



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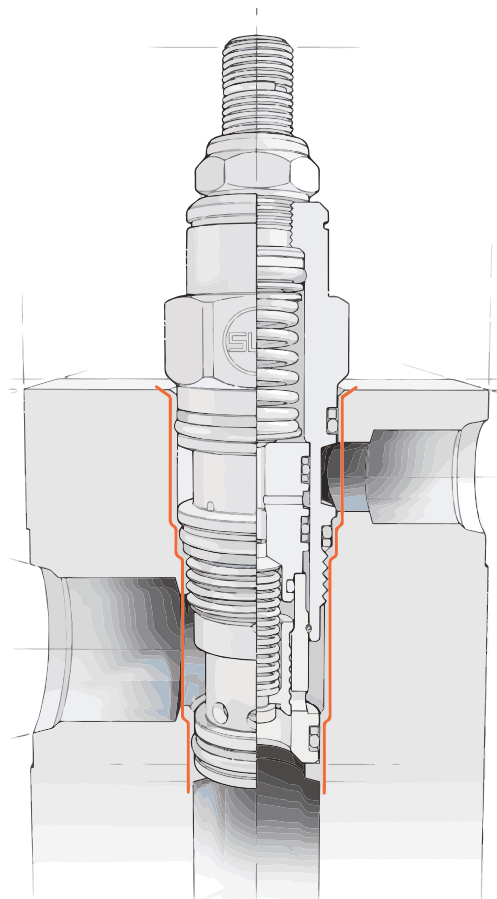
Sun Cavity

7 cartridge sizes
with flow rates
from 0.25 gpm
(1 L/min.) to 300
gpm (1100 L/min.)

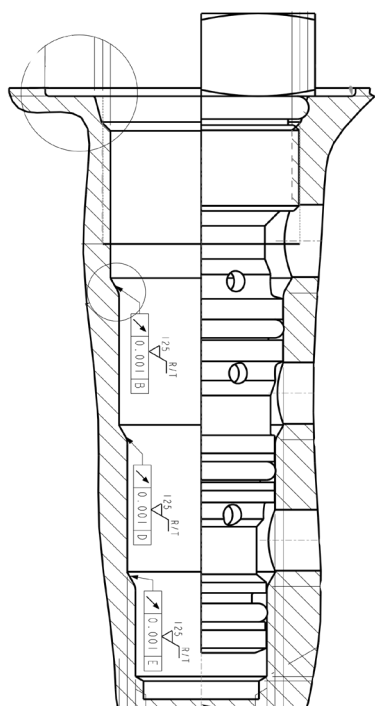
Max operating
pressures
up to **5000 psi**
(350 bar)

Functionally
interchangeable

Free-floating
subassembly
tolerates
eccentricity
between cavity &
cartridge nose



Sun Common Cavity



SAE cavity
standard
ISO 17209:2013

Optimized for
lower pressure
systems

Common SAE style
cavity for
interchangeable
solutions

Cross
compatibility
with many valves
& manifolds

Materials of Construction

CARTRIDGES

Sun Hydraulics' cartridge valves are available in a variety of materials and coatings to serve your needs and environmental conditions. Internal cartridge components are constructed of carbon steel leaded alloys.

- Steel
- Stainless steel
- Zinc-nickel plated

MANIFOLDS

Wrought aluminum surface treatments

- Clear anodize
- Black anodize

Ductile iron surface treatments

- Trivalent clear zinc with top sealer
- Chemical blackening
- Dewatering oil
- Clear zinc-nickel with top sealer

SEALS

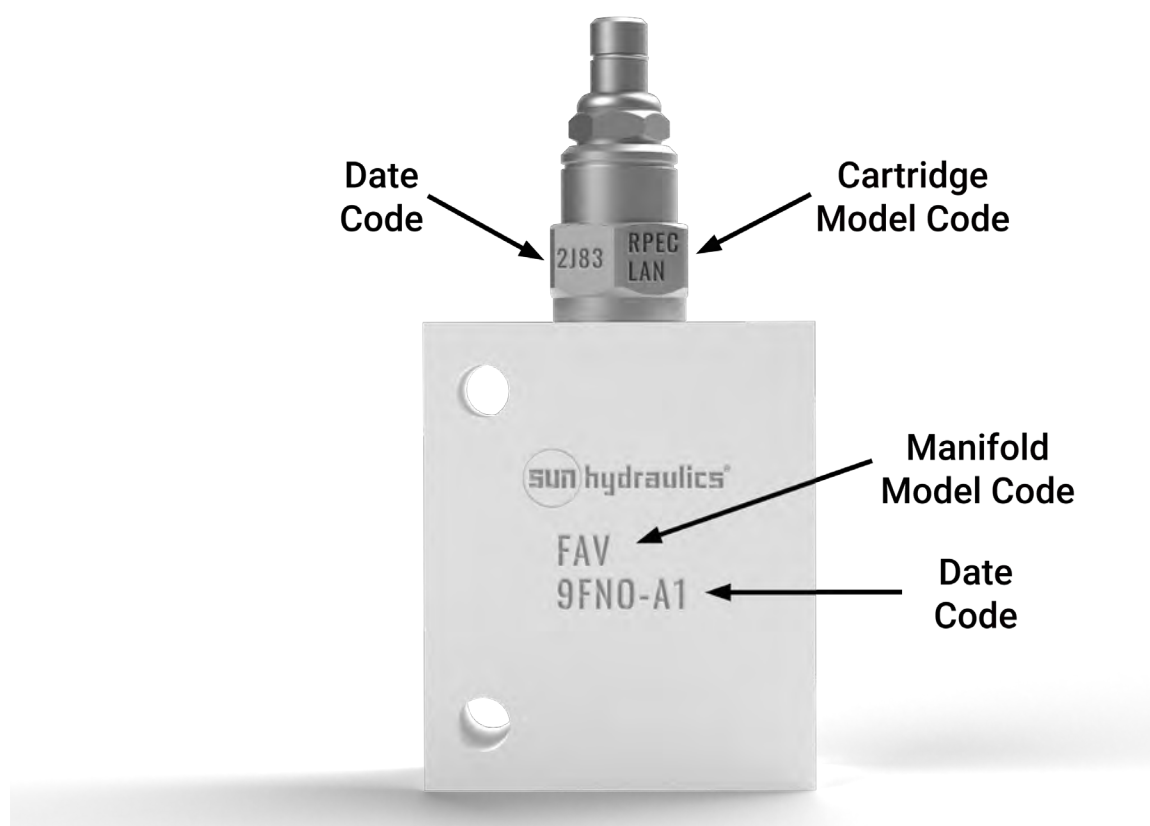
- **Buna N (Nitrile)** - 10-year shelf life
- **Fluorocarbon Rubber FKM (Viton®)**, product of E.I. DuPont) - 20-year shelf life
- **EPDM** - No limited shelf life
- **Polyurethane** - 10-year shelf life

Model Code Explanation

Sun cartridges have a base seven character model code. Manifold model codes are a three-character combination stamped on one face of the manifold, normally below the Sun Hydraulics logo. Available options and modifiers for specific cartridges, manifolds, and standard assemblies are shown on the individual product pages and

data sheets. Not all modifiers are applicable for every model.

Sun stamps a date code on products to track production history. Date codes are stamped on one of the hex body flats on cartridges, and on one surface of standard bodies.



Quality Certifications & Declarations

GENERAL CERTIFICATIONS & ISO CERTIFICATIONS

Please find the current listing of certifications applicable to Sun Hydraulics and its products on our website: www.sunhydraulics.com/quality-certifications.

Performance Data

PRESSURE & FLOW RATINGS

Cartridge pressure rating follows NFPA T2.6.1 standards, with a 90/90 assurance and verification level for a 5000 psi (350 bar) rating. Sun Cartridges generally hold a 5000 psi (350 bar) (6000 psi [420 bar] intermittent) rating in US 65-45-12 ductile iron, and 3000 psi (210 bar) in US 6061-T6 aluminum manifolds. Testing uses Chevron Rando HD ISO 32 oil at 110°F (42°C), with leakage measured in drops per minute—250 drops equate to one cubic inch (16 cc). All performance data stems from Sun's R&D lab.

PRESSURE SETTING TOLERANCES

Sun sets all standard adjustable pressure control valves within ± 15 psi or $\pm 2.5\%$ of the target pressure, whichever is higher. Custom valves may be subject to different tolerances. Note: Wider tolerances may be observed in the field due to varying factors.

Fluid Recommendations:

VISCOSITY

2,8 to 380 cst or 35 to 2000 SUS

CLEANLINESS

Specified in accordance with ISO 4406:1999; 4 μm /6 μm /14 μm

Electrohydraulic cartridge valves: 15/13/11

All other cartridge valves: 19/17/14

TESTING

Sun cartridge valves go through functional testing using petroleum-based hydraulic fluid with a viscosity of 125 SUS prior to shipment. Filtration in Sun's test stands is 3 microns with oil temperature at 110° F (42° C). Test fluid cleanliness level meets or exceeds ISO 4406 Solid Contamination Code 19/17/14.

TEMPERATURE

Cartridge Seal Material N:

Buna N (Nitrile) -22 to 230° F (-30 to 110° C)

Cartridge Seal Material V:

Fluorocarbon Rubber FKM (Viton®, product of DuPont) -10 to 250° F (-20 to 120° C)

Cartridge Seal Material E:

EPDM (Ethylene Propylene Diene Monomer) -70 to 250° F (-60 to 120° C)



Pressure Control

Pressure control valves maintain a specific pressure level within a hydraulic system. They help prevent overpressure or under-pressure conditions, ensuring optimal performance, efficiency, and safety.

RELIEF

SEQUENCE

REDUCING

REDUCING/RELIEVING



Max operating pressure 5000 psi (350 bar) | Functionally interchangeable | 5 frame sizes with capacities up to 200 gpm (800 L/min.) | Integral pilot control cavity for Sun's T8A pilot pressure controls | Industry-standard cavity option



Flow Control

Flow control valves precisely regulate the flow in a hydraulic system. Flow control valves can also be used to give priority to one function over another.

NEEDLE

FLOW DIVIDER-COMBINER

THROTTLE

FLOW FUSE

FLOW DIVIDER

MODULATING SPOOL



Max operating pressure 5000 psi (350 bar) | Capacities up to 140 gpm (530 L/min.) Includes electro-proportional throttle valves | Fully adjustable and pressure compensated configurations



Load Holding

An important safety device, load holding valves prevent loads from dropping in an uncontrolled manner, regardless of whether that load is a pallet of bricks or even a person. They can also lock a load in place by preventing oil flow from the actuator.

COUNTERBALANCE

LOADMATCH™

PILOT TO OPEN CHECK

LOAD CONTROL

LOADADAPTIVE™



Max operating pressure 5000 psi (350 bar) | Capacities up to 120 gpm (480 L/min.)
Virtually zero leakage | Available in zinc-nickel and stainless steel | Multiple seal configurations | Functionally interchangeable



Directional

Directional valves control the direction of fluid in a hydraulic circuit.

CHECK

DIVERTER

LOGIC ELEMENT

2, 3, 4, AND 6-WAY

SHUTTLE



Max operating pressure 5000 psi (350 bar) | Capacities up to 120 gpm (480 L/min.) | Integral pilot control cavity optional | Position indication available | Industry-standard cavity option



Electro-proportional / Solenoid Operated _____

Solenoid and electro-proportional valves control the flow, direction, or pressure in a hydraulic system from electrical power applied to the solenoid coil. Switching solenoid valves are either on or off, comparable to a light switch. Electro-proportional valves have a varying opening based upon how much electrical power is applied to the solenoid coil, similar to a dimmer light switch.

FLOW CONTROL

REDUCING/RELIEVING

RELIEF

2-, 3-, 4-, AND 6-WAY

REDUCING

SEQUENCE



Max operating pressure 5000 psi (350 bar) | Capacities up to 200 gpm (760 L/min.)
Functionally interchangeable | Integral pilot control cavity for Sun's T8A pilot pressure controls | Industry-standard cavity option



Logic Element _____

Logic valves are switching elements that change positions based upon a pilot signal (similar to directional valves) and some change positions based upon a pilot signal and pressures at the working ports.

MODULATING SPOOL

BALANCED POPPET

UNBALANCED POPPET



Max operating pressure 5000 psi (350 bar) | Flow rates up to 300 gpm (1100 L/min.) | Available in Modulating and Switching functions | Switching cartridges available in balanced and unbalanced



T-8A Integral Cavity

The T-8A valves are a collection of unique valves from Sun that fit into the T-8A cavity that can be used individually or as the pilot stage in a two-stage arrangement. When applied to the hex body of a larger frame size valve, they allow the pilot stage to control flows in excess of 200 gpm (760 L/min.)

2-, 3-WAY

LOGIC ELEMENT

RELIEF

MODULATING SPOOL

REDUCING

FLOW CONTROL

REDUCING/RELIEVING

SEQUENCE



Max operating pressure 6000 psi (420 bar) | Customized solutions with standard components | Wide variety of pilot-stage controls; manual or electro-hydraulic



Specialty

Sun Hydraulics designs a broad array of products that defy conventional categorization. Specialty cartridges are useful devices that help machine designers get around difficult and perplexing circuit problems.

HAND PUMP

FILTER

AIR BLEED AND START-UP

FLOW FUSE

CAVITY PLUG

ACCUMULATOR SENSE,
PUMP UNLOAD

CONVERTER



Max operating pressure 5000 psi (350 bar) | Capacities up to 80 gpm (320 L/min.)

STANDARD MANIFOLDS

- Line Mount
- Sandwich
- Motor Mount
- Sub Plate
- Bar Manifold
- Gasket Mount

SOLUTIONS

Standard integrated packages for specific functions:
Regeneration, Priority Flow Control, Solenoid Operated Pilot Relief, Rapid Advance and Feed, and many more

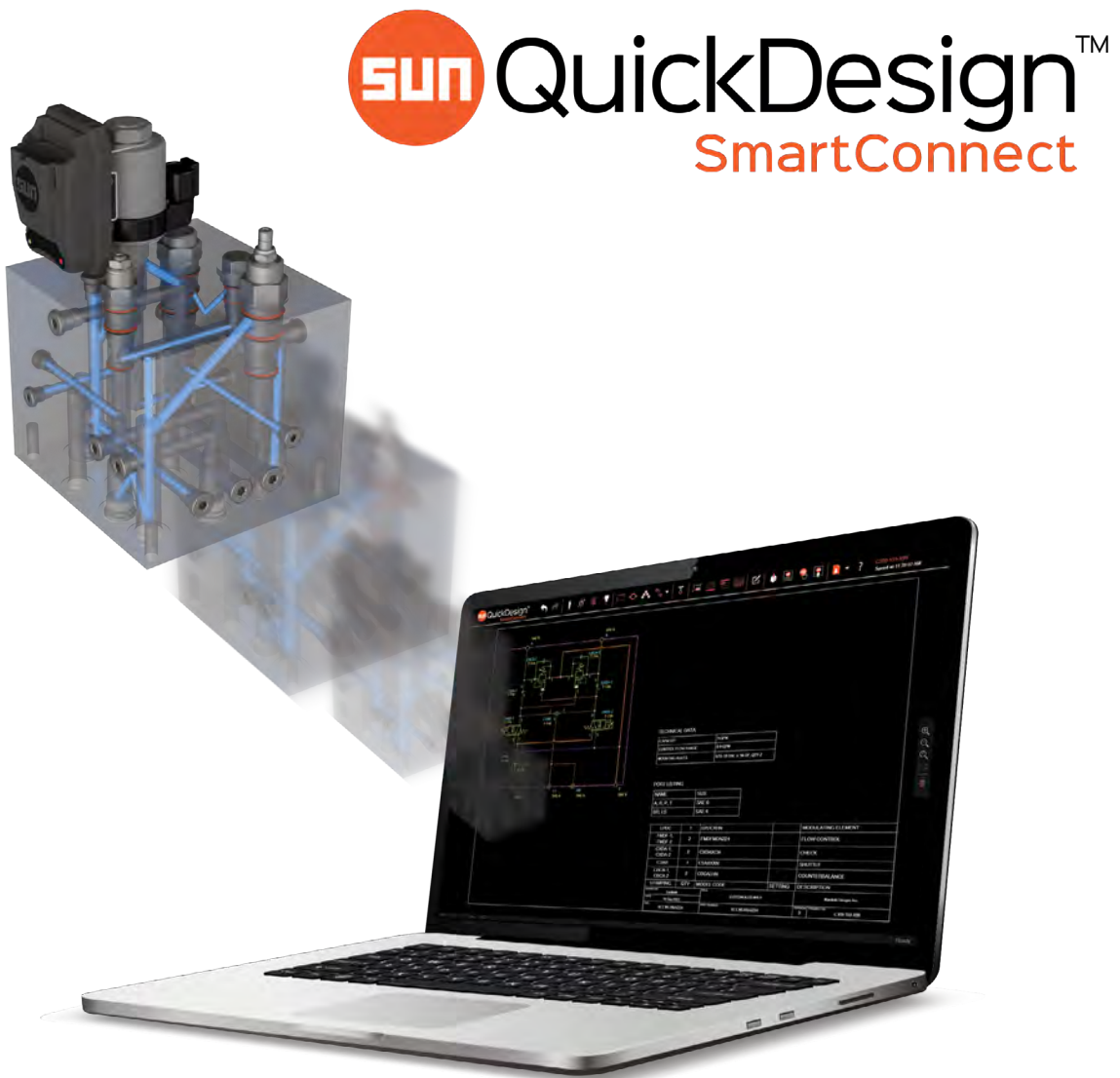
CUSTOM INTEGRATED PACKAGES by SUN DESIGN

Our global design engineers provide engineering assistance and design evaluation, leveraging our 5-axis machining capabilities to produce optimized designs for more complex, high-volume applications.



QuickDesign™

QuickDesign is the only free, browser-based integrated package design program in the hydraulics industry. And now it includes the SmartConnect schematic tool that allows you to take your idea from product specification to design using drag-and-drop, point-and-click tools. Streamline your design process with QuickDesign™.



FAST. CUSTOM. FREE

ELECTRONICS

- **XMD-01 & XMD-02** - Electro-hydraulic driver for use with mobile and industrial hydraulic equipment
- **Software** - CANpoint XMD configuration software, XMD Mobile App
- **Coils** - Hazardous location, explosion proof, and common cavity
- **Cables**

ACCESSORIES

- Gauge port snubber/adaptors/line fuses
- Cartridge control options
- Cartridge seal kits, retainers, and special tools
- Filter elements
- Deep hex sockets
- Faster couplings
- Studnuts/studrods
- Coil seal kits
- Taimi swivel fittings
- Manifold seals and seal retainer plates



ENGINEERING SERVICES

NEW PRODUCT DEVELOPMENT

Have a need for a product with special functionality? Let's talk.

www.sunhydraulics.com/contact/colleague-npi

TECHNICAL SUPPORT

All our operations in the US, UK, Germany, Korea, China, and India are staffed with engineers and product specialists who speak the local language as well as English to provide you with the technical support and expertise you need.

Contact your local Sun Hydraulics office or complete our Technical Support form:

www.sunhydraulics.com/contact?subject=tech

CUSTOMER SERVICE

We gauge our success by your satisfaction. At Sun, you'll speak with an actual person, not an automated system. Our customer service representatives create relationships, resolve issues and questions about products, services, and policies, assist in placement of orders and returns, and create memorable experiences by supporting customers.

GLOBAL FOOTPRINT

Our authorized distributors and system integrators provide Sun products and expertise when and where you need it most. We have a long standing relationship with our distributors; they provide local market knowledge, technical expertise, and the inventory to meet your needs. Find your local expert: www.sunhydraulics.com/distributors.

MANUFACTURING

Our manufacturing team constantly examines and refines our manufacturing operations to maximize production efficiency. Incorporating Lean manufacturing principles and in-depth product assembly training for new employees helps them to expand their skillsets quickly and effectively, allowing Sun to build a much more advanced workforce.

TRAINING

Sun Hydraulics hosts events throughout the year, both at our facilities and online. Many of our online events are open to the public, and we have regular onsite opportunities for our authorized representatives at our facilities around the world.

www.sunhydraulics.com/about/events

about us

Sun Hydraulics is a global leader in designing and manufacturing high-performance hydraulic components and solutions. Specializing in screw-in hydraulic cartridge valves, manifolds, and integrated packages, Sun Hydraulics prioritizes innovation, efficiency, and durability. Serving diverse industries such as mobile equipment, industrial machinery, renewable energy, and marine applications, we strive to provide advanced motion control and reliable performance. As a subsidiary of Helios Technologies, Inc., Sun Hydraulics boasts a worldwide presence with a strong commitment to sustainability and customer satisfaction.



A HELIOS TECHNOLOGIES COMPANY

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