Electric Distributor Expansion Valve
for Air Conditioning and Heat Pump Applications
RACE Catalogue 100-20-3 EDEV-2, February 2013
The Sporlan EDEV (Electric Distributor Expansion Valve) is a cartridge EEV with an integrated refrigerant distributor. The directly coupled EEV and distributor provides more benefits than just a compact and robust package. By modulating refrigerant expansion directly into a distributor, there is no opportunity for refrigerant stratification, eliminating the need for a secondary pressure drop (such as a distributor orifice or venturi). Sporlan’s EDEV achieves superior distribution and maintains high velocity flow across all load conditions, resulting in higher system efficiency.

Designed with the requirements of air conditioning and heat pump applications in mind, the EDEV features an internal (wet) unipolar stepper motor that provides up to 320% more resolution than competing designs. Currently available with two port sizes, it is possible to cover a product line up to 6T (21 kW) with only one or two expansion valves. And without the need to size a distributor orifice, SKU proliferation and development time are dramatically reduced.

Featuring up to 300% more corrosion resistance than competing designs, the Sporlan EDEV is perfect for indoor or outdoor installation. This protection level includes an industry standard, removable M12 connection (A-coded), which is rated IP67. The Sporlan cable is offered standard with a JST XARP-05V connector.

Features
- Unipolar stepper motor
- High resolution actuator
- “Bi-flow”
- Superior refrigerant distribution
- Unmatched corrosion resistance
- Removable IP67 cable
- Optional robust internal check valve
- Brass/Copper or Aluminum construction
- Two-wrench installation / service
- No mounting orientation restrictions

Figure 1 - EDEV Flow Curve Capacity
(EDEV capacity does not include the effect of distributor tubes.)
To further reduce package size and eliminate multiple braze joints, the EDEV is suitable for bi-flow applications, which make it perfect for air to water heat pump systems as well, the Sporlan EDEV can be mounted in any position, with no mounting orientation restrictions, and no concerns about refrigerant hammering or protective coverings. And with two-wrench installation of the EEV, the risk of overheating during brazing is eliminated, the required skill set for service contractors is reduced, and it is now possible to clean the check valve of any foreign debris.

Available in typical brass/copper construction, the Sporlan EDEV is available in all aluminum construction as well. It has never been easier to integrate an aluminum evaporator with an expansion device, as the distributor can be brazed in controlled conditions, and the EEV can be installed and serviced without the use of a torch, eliminating the risk associated with hand brazing aluminum.

Be sure to ask us about our advanced superheat control algorithms and controls!

### Specifications

| **Motor Type** | Permanent magnet unipolar wet motor |
| **Compatible Refrigerant** | All common HCFC and HFC refrigerants, including R-410A |
| **Compatible Oil** | All common mineral, polyester and alkylbenzene oils |
| **Supply Voltage** | 12 volts DC +/-10% |
| **Cable Type** | IP67 removable M12 connection (A-coded) |
| **Phase Resistance** | 100 ohms +/- 10% |
| **Stepping Current** | 120 mA / winding |
| **Holding Current** | Not recommended |
| **Number of Steps** | 1600 half steps 800 full steps (with bipolar controller) |
| **Step Rate** | 200/second |
| **Full Stroke Transit Time** | 8 seconds (unipolar) 4 seconds (bipolar) |
| **Initialization** | 2500 steps closing (unipolar) 1250 steps closing (bipolar) |
| **Overdriving** | Recommend one 10% overdrive closed per day (overdriving open not permitted) |
| **MRP / MWP (PS)** | 700 psig (48 bar) |
| **MOPD both directions** | 580 psid (40 bar) |
| **Maximum Internal Leakage** | 300 cc/min @ 100 psid (6.9 bar) dry air |
| **Maximum External Leakage** | .10 oz/yr at 300 psig (2.8 gram/yr @ 20 bar) |
| **Fluid Temperature Range** | -40°F to 155°F (-40°C to 68°C) |
| **Ambient Temperature Range** | -40°F to 140°F (-40°C to 60°C) |
| **Installation Maximum Temperature** | 250°F (60°C) for 15 minutes |
| **Relative Humidity** | 0-100% (Condensing) |
| **Mounting Orientation** | No restrictions |
| **Flow Direction** | Side Inlet (Bi-flow) Internal check valve available |
| **Materials of Construction** | Brass body with copper connections or all aluminum |
| **Number of Circuits** | 3/16” - 2 to 9 1/4” - 2 to 8 |
| **Circuit Tube Lengths** | Up to 36” (91.44 cm) |
| **Minimum Order Quantity** | 500 Valves |
### Ordering Instructions / Nomenclature

<table>
<thead>
<tr>
<th>EDEV</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td>Valve Family</td>
<td>Valve Model B or C</td>
<td>Bi-Flow &quot;Omit&quot; Optional with Check Valve &quot;C&quot;</td>
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<thead>
<tr>
<th>U</th>
<th>1/4&quot; ODF</th>
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<tr>
<td>Unipolar Step Motor</td>
<td>Inlet Connection Size - Inches (1/4, 3/8, 1/2) and Fitting Type</td>
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<table>
<thead>
<tr>
<th>2 to 9</th>
<th>2 to 8</th>
<th>3/16&quot;</th>
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<tbody>
<tr>
<td>Number</td>
<td>Diameter</td>
<td>1/4&quot;</td>
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<table>
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<th>≤36&quot;</th>
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<td>Length</td>
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<table>
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<tr>
<th>1/4&quot; Bell</th>
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<tr>
<td>End Bell - Inches Optional (1/4, 5/16, 3/8)</td>
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<th>5′ - J</th>
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<tr>
<td>Less Cable</td>
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<tr>
<th>CABLE</th>
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<tr>
<td>Cable Length with JST XARP-05V Connector</td>
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### Accessories

- Temperature Sensor
- M12 Cable
- Pressure Transducer
- AC & Heat Pump Super Heat Controller
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WARNING - USER RESPONSIBILITY
FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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**Aerospace**

**Key Markets**
- Aircraft services
- Commercial transports
- Engines
- General & business aviation
- Helicopters
- Launch vehicles
- Military aircraft
- Missiles
- Power generation
- Regional transports
- Unmanned aerial vehicles

**Key Products**
- Control systems & actuation products
- Engine systems & components
- Fuel conveyance systems & components
- Fuel metering, delivery & abatement devices
- Fuel systems & components
- Fuel tank sensing systems
- Hydraulic systems & components
- Thermal management
- Wheels & brakes

**Climate Control**

**Key Markets**
- Agriculture
- Air conditioning
- Construction Machinery
- Food & beverage
- Industrial machinery
- Life sciences
- Oil & gas
- Precision cooling
- Process
- Refrigeration
- Transportation

**Key Products**
- Accumulators
- Advanced actuators
- CO₂ controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Heat exchangers
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Small pumps
- Soldering valves
- Thermostatic expansion valves

**Electromechanical**

**Key Markets**
- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastic machinery & converting
- Primary metals
- Semiconductors & electronics
- Textile
- Wire & cable

**Key Products**
- A/D/C drives & systems
- Electric actuators, grapples & robots
- Electrohydraulic actuation systems
- Electromechanical actuation systems
- Human machine interfaces
- Linear motors
- Slipper motors, servo motors, drives & controls
- Structural inductions

**Filtration**

**Key Markets**
- Aerospace
- Food & beverage
- Industrial plant & equipment
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation & renewable energy
- Process
- Transportation
- Water Purification

**Key Products**
- Analytical gas generators
- Compressed air filters & dryer
- Engine oil, coolant, fuel & oil filtration systems
- Fluid condition monitoring systems
- Hydraulic & lubrication filters
- Hydrogen, nitrogen & zero air generators
- Instrumentation filters
- Membrane & flow filters
- Microfiltration
- Steam air filtration
- Water desalination & purification filters & systems

**Fluid & Gas Handling**

**Key Markets**
- Aerial lift
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Life sciences
- Marine
- Mobile
- Oil & gas
- Renewable energy
- Transportation

**Key Products**
- Check valves
- Connectors for low pressure fluid conveyance
- Deep sea umbilicals
- Diagnostic equipment
- Hose couplings
- Industrial hose
- Misting systems & power cables
- PTFE hose & tubing
- Quick couplings
- Rubber & thermoplastic hose
- Tube fittings & adapters
- Tubing & plastic fittings

**Hydraulics**

**Key Markets**
- Aerial lift
- Agriculture
- Alternative energy
- Construction machinery
- Foody
- Industrial machinery
- Machine tools
- Marine
- Material handling
- Mining
- Oil & gas
- Power generation
- Refuse vehicles
- Renewable energy
- Truck hydraulics
- Turf equipment

**Key Products**
- Accumulators
- Cartridge valves
- Electrohydraulic actuators
- Human machine interfaces
- Hybrid drives
- Hydraulic cylinders
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Hydraulic steering
- Integrated hydraulic circuits
- Power take-offs
- Power units
- Rotary actuators
- Sensors

**Pneumatics**

**Key Markets**
- Aerospace
- Cylinders & material handling
- Facility automation
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

**Key Products**
- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & air pipes
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural inductions
- Thermoplastic tubing & fittings
- Vacuum generators, caps & sensors

**Process Control**

**Key Markets**
- Alternative fuels
- Biopharmaceuticals
- Chemical & refining
- Chemical & petrochemical
- Food & beverage
- Marine & shipbuilding
- Medical & dental
- Microelectronics
- Nuclear Power
- Offshore oil exploration
- Oil & gas
- Pharmaceuticals
- Power generation
- Pub & paper
- Steel
- Water/wastewater

**Key Products**
- Analytical instruments
- Analytical sample conditioning products & systems
- Chemical injection fittings & valves
- Chemical injection fittings & valves & pumps
- Chemical, water & gas fitting, valves, & controllers
- Flow metering & controls
- Industrial mass flow meters/ controllers
- Permanent no web tubular fittings
- Precision industrial regulators & flow controls
- Process control valves
- Process control fittings, valves, & regulators, & manifold valves

**Sealing & Shielding**

**Key Markets**
- Aerospace
- Chemical processing
- Consumer
- Fluid power
- General industrial
- Information technology
- Life sciences
- Microelectronics
- Military
- Oil & gas
- Power generation
- Renewable energy
- Telecommunications
- Transportation

**Key Products**
- Dynamic seals
- Elastomeric o-rings
- Electro-medical instrument design & assembly
- EVI sealing
- Extruded & precision cut, fabricated elastomeric seals
- High temperature metal seals
- Homogeneous & inserted elastomeric shapes
- Medical device fabrication & assembly
- Metal & plastic retained composite seals
- Shielded optical windows
- Silicone tubing & extrusions
- Thermal management
- Vibrational damping
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