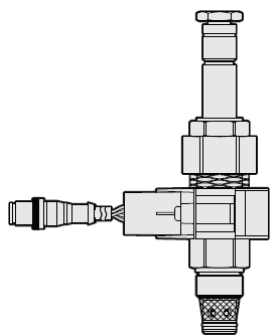
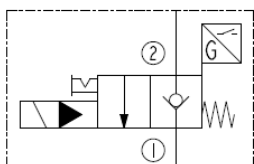




## Overview



### Symbol



### Description

A solenoid-operated, 2 port, normally closed, poppet-type, screw-in hydraulic cartridge valve, designed to function as a load holding or blocking valve in applications requiring low internal leakage.

### Operation

When de-energized, the SV10-P20AX acts as a check valve, allowing flow to pass from port 1 to port 2, while blocking flow in the reverse direction. When energized, the poppet lifts to the port 2 to port 1 flow path. In this mode, flow from 1 to 2 is severely restricted.

### Features

- Integral position sensor indicates when valve is shifted.
- Continuous-duty rated coil.
- Hardened seat for long life and low leakage.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Waterproof E-Coils rated up to IP69K.
- Unitized, molded coil design.
- 960 hour salt-spray rated solenoid tubes and coils.

## Ratings

### Pressure Ratings

|                 |                      |
|-----------------|----------------------|
| Pressure rating | 207 bar (3000 psi)   |
| Proof pressure  | 345 bar (5000 psi)   |
| Burst pressure  | 827 bar (12,000 psi) |

### Flow Ratings

|                          |                                                                                                                                                                                                                                                |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flow rating              | 56.8 lpm (15 gpm)                                                                                                                                                                                                                              |
| Maximum internal leakage | 5 drops/min - <b>Note:</b> With 207 bar (3000 psi)<br>0.3 lpm (0.07 gpm) - <b>Note:</b> Typical flow (leakage) in transition at 207 bar (3000 psi). (see "Flow vs % Valve Shift" graph for flow in transition from valve close to valve open). |

### Other Ratings

|                         |                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Minimum pull-in voltage | 10.2 Vdc - <b>Note:</b> 12 Vdc coil                                                                                                                                                                                                                                                                                                                               |
| Response                | 83 ms - <b>Note:</b> Pull-in. Response times measured per NFPA/T3.5.30-2008<br>*Inlet pressure at port 2 is 207 bar (3000 psi) *Valve oriented vertically (2-1) and purged of air<br>53 ms - <b>Note:</b> Drop-out. Response times measured per NFPA/T3.5.30-2008<br>*Inlet pressure at port 2 is 207 bar (3000 psi) *Valve oriented vertically and purged of air |

### Temperature Ratings

|                                       |                                                                                                                                  |                                                                                                                                              |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Operating fluid temperature           | -40 to 100 °C (-40 to 212 °F)<br>-26 to 204 °C (-15 to 400 °F)<br>-54 to 107 °C (-65 to 225 °F)<br>sensor operating temperature* | - <b>Note:</b> With buna N seals<br>- <b>Note:</b> With fluorocarbon seals *See Position<br>- <b>Note:</b> With urethane seals *See Position |
| Storage temperature                   | -40 to 70 °C (-40 to 160 °F)                                                                                                     |                                                                                                                                              |
| Ambient temperature                   | -40 to 70 °C (-40 to 160 °F)                                                                                                     |                                                                                                                                              |
| Position sensor operating temperature | -40 to 110 °C (-40 to 230 °F)                                                                                                    | - <b>Note:</b> Sensor element operating temperature limits the operating temperature of the entire assembly                                  |

## Operating Parameters

|                                       |                                                                        |
|---------------------------------------|------------------------------------------------------------------------|
| Fluids                                | Mineral based or synthetic hydraulic fluid with lubricating properties |
| Fluid viscosity range                 | 7.4 to 420 cSt                                                         |
| Maximum operating contamination level | 20/18/14 per ISO 4406                                                  |

## Position Sensor Specifications

### Electrical Parameters

|                                    |             |                                     |
|------------------------------------|-------------|-------------------------------------|
| Supply voltage                     | 9 to 32 Vdc | - <b>Note:</b> Vcc                  |
| Output voltage with target present | Vcc         |                                     |
| Output clamp current               | 40 to 65 mA | - <b>Note:</b> For Vcc up to 32 Vdc |

### Ratings

|                  |        |                                            |
|------------------|--------|--------------------------------------------|
| ESD              | ±8 kV  | - <b>Note:</b> Air discharge               |
| EMI              | 30 V/m | - <b>Note:</b> From 400 MHz to 2 GHz       |
| IP rating        | IP67   |                                            |
| Vibration        | 10 G   | - <b>Note:</b> 10 to 2000 Hz sinusoidal    |
| Mechanical shock | 50 G   | - <b>Note:</b> 11 ms, half-wave sinusoidal |

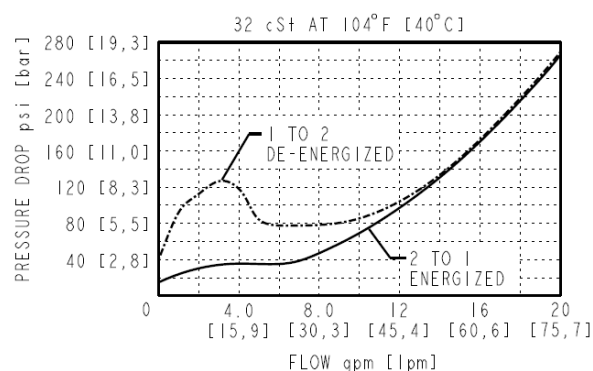
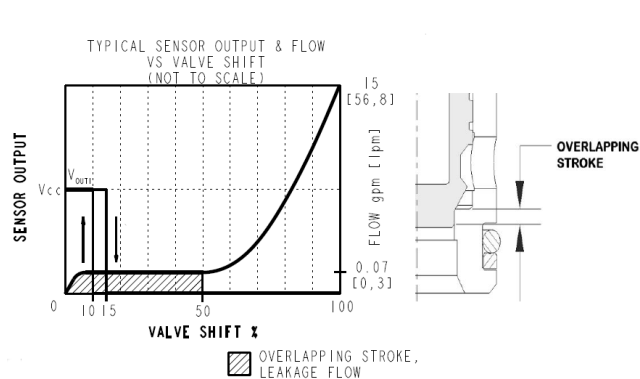
### Properties

|           |                 |                                        |
|-----------|-----------------|----------------------------------------|
| Connector | Deutsch DT04-4P | - <b>Note:</b> Option N3 (dual output) |
|           | M12             | - <b>Note:</b> Option M3 (dual output) |

## Properties

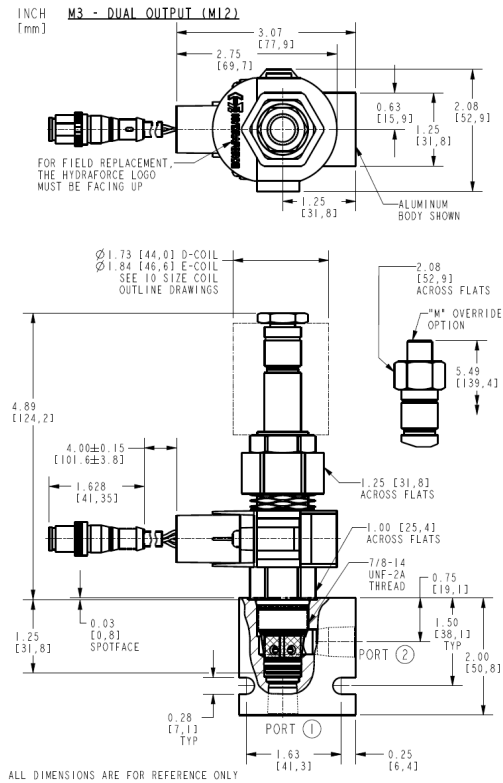
|                              |                                             |                          |
|------------------------------|---------------------------------------------|--------------------------|
| Unit weight                  | 0.49 kg (1.07 lb)                           | - <b>Note:</b> Cartridge |
| Internal wetted surface area | 220 cm <sup>2</sup> (34.2 in <sup>2</sup> ) |                          |

## Performance



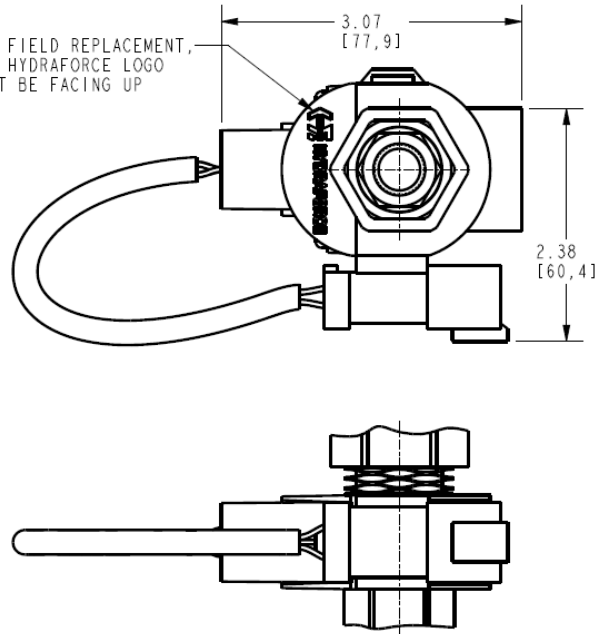


## Dimensions



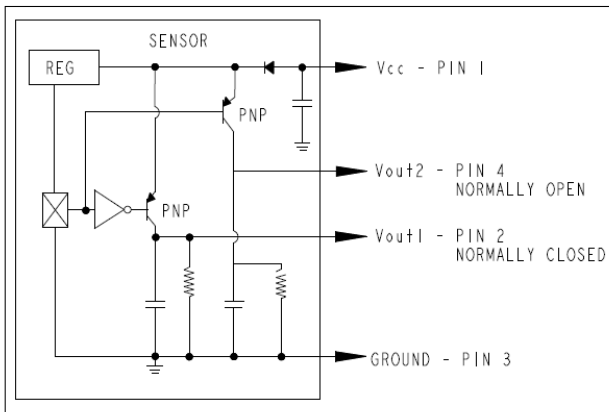
## N3 - DUAL OUTPUT (DT04-4P)

FOR FIELD REPLACEMENT, THE HYDRAFORCE LOGO MUST BE FACING UP

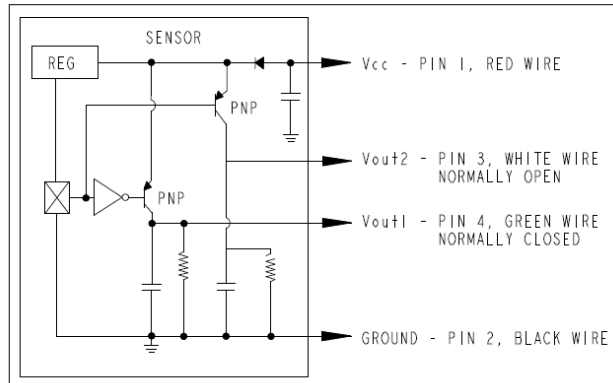


## Wiring Diagrams

### M3 SENSOR WIRING DIAGRAM



### N3 SENSOR WIRING DIAGRAM



## Installation Specifications

|                               |                                   |
|-------------------------------|-----------------------------------|
| Cavity                        | VC10-2                            |
| Cartridge installation torque | 32.5 to 35.3 N-m (24 to 26 ft-lb) |
| Coil nut torque               | 6.8 to 9.5 N-m (5 to 7 ft-lb)     |
| Orientation restriction       | None                              |

## Accessories

|          |           |                                |
|----------|-----------|--------------------------------|
| Seal kit | SK10-2X-T | - <b>Note:</b> X = Seal option |
|----------|-----------|--------------------------------|

## Order Code

**ORDERING INFORMATION**

SV10-P20Axx-x-x-xxxx-xx

**BASE MODEL NUMBER**POSITION INDICATOR SWITCH - P  
RESTRICTED FLOW - A**OVERRIDE OPTION**NONE - BLANK  
MANUAL OVERRIDE - M**SCREEN OPTION**NONE - BLANK  
SCREEN - S**PORTING**

CARTRIDGE ONLY - 0

**SEAL OPTIONS**BUNA-N - N  
FLUOROCARBON - V  
POLYURETHANE - P**COIL VOLTAGE**LESS COIL - 00  
12 VDC COIL - 12  
24 VDC COIL - 24**COIL TERMINATIONS**E-COIL OPTIONS:  
METRI-PACK CONNECTOR - EY  
DEUTSCH CONNECTOR - ER  
D-COIL OPTIONS:  
(2) LEADWIRES 18"  
STANDARD LENGTH - DL  
DUAL SPADES SAE J858a - DS  
DIN 43650 - DG**SENSOR OUTPUT**DUAL OUTPUT (DT04-4P) - N3  
DUAL OUTPUT (M12) - M3**Model Options****SV10-P20AEG-H-J-L-M****E Manual Override**

| CODE  | DESCRIPTION                             |
|-------|-----------------------------------------|
| BLANK | NONE                                    |
| M     | Two Position Override, Red Knurled Knob |

**G Screen**

| CODE | DESCRIPTION     |
|------|-----------------|
| S    | 100 Mesh Screen |

**H Line Body**

| CODE | DESCRIPTION                |
|------|----------------------------|
| 0    | No Body                    |
| 6T   | Aluminum SAE 6             |
| 8T   | Aluminum SAE 8             |
| 6TD  | Ductile Iron SAE 6         |
| 8TD  | Ductile Iron SAE 8         |
| 2B   | Aluminum BSPP 1/4" (2)     |
| 3B   | Aluminum BSPP 3/8" (3)     |
| 4B   | Aluminum BSPP 1/2" (4)     |
| 4BD  | Ductile Iron BSPP 1/2" (4) |

**J Seal**

| CODE | DESCRIPTION  |
|------|--------------|
| N    | Buna-N       |
| V    | Fluorocarbon |
| P    | Polyurethane |



| CODE | DESCRIPTION      |
|------|------------------|
| U    | PPDI<br>Urethane |

**L Coil**

| CODE     | DESCRIPTION                                                     |
|----------|-----------------------------------------------------------------|
| 0        | No Coil                                                         |
| 10DG     | 10 VDC, D-Coil, DIN 43650                                       |
| 10DL     | 10 VDC, D-Coil, Dual Lead Wires                                 |
| 10DR/D   | 10 VDC, D-Coil, Deutsch with Diode                              |
| 10DS     | 10 VDC, D-Coil, Dual Spade                                      |
| 10EL     | 10 VDC, E-Coil, Dual Lead Wires                                 |
| 10ER     | 10 VDC, E-Coil, Deutsch                                         |
| 10ER/Z   | 10 VDC, E-Coil, Deutsch with Zener Diode                        |
| 12DG     | 12 VDC, D-Coil, DIN 43650                                       |
| 12DL     | 12 VDC, D-Coil, Dual Lead Wires, 18 inches long                 |
| 12DL/36  | 12 VDC, D-Coil, Dual Lead Wires, 36 inches long                 |
| 12DL/W   | 12 VDC, D-Coil, Dual Lead Wires with Weatherpak                 |
| 12DL/W/D | 12 VDC, D-Coil, Dual Lead Wires with Weatherpak with Diode      |
| 12DR     | 12 VDC, D-Coil, Deutsch                                         |
| 12DR/D   | 12 VDC, D-Coil, Deutsch with Diode                              |
| 12DR/Z   | 12 VDC, D-Coil, Deutsch with Zener Diode                        |
| 12DS     | 12 VDC, D-Coil, Dual Spade                                      |
| 12EG     | 12 VDC, E-Coil, DIN 43650                                       |
| 12EJ     | 12 VDC, E-Coil, AMP Jr.                                         |
| 12EL     | 12 VDC, E-Coil, Dual Lead Wires, 18 inches long                 |
| 12EL/36  | 12 VDC, E-Coil, Dual Lead Wires, 36 inches long                 |
| 12EL/W/Z | 12 VDC, E-Coil, Dual Lead Wires with WeatherPak and Zener Diode |
| 12EL/Z   | 12 VDC, E-Coil, Dual Lead Wires with Zener Diode                |
| 12ER     | 12 VDC, E-Coil, Deutsch                                         |
| 12ER/Z   | 12 VDC, E-Coil, Deutsch with Zener Diode                        |
| 12EY     | 12 VDC, E-Coil, Metri-Pack 150                                  |
| 12EY/Z   | 12 VDC, E-Coil, Metri-Pack 150 with Zener Diode                 |
| 20DR/D   | 20 VDC, D-Coil, Deutsch with Diode                              |
| 20DS     | 20 VDC, D-Coil, Dual Spade                                      |
| 20ER     | 20 VDC, E-Coil, Deutsch                                         |
| 24AG     | 24 VDC, D-Coil, DIN 43650                                       |
| 24AP     | 24 VDC, D-Coil, 1/2" Conduit and Dual Lead Wires                |
| 24DG     | 24 VDC, D-Coil, DIN 43650                                       |
| 24DL     | 24 VDC, D-Coil, Dual Lead Wires                                 |
| 24DL/W   | 24 VDC, D-Coil, Dual Lead Wires with Weatherpak                 |
| 24DL/W/D | 24 VDC, D-Coil, Dual Lead Wires with Weatherpak with Diode      |
| 24DP     | 24 VDC, D-Coil, 1/2" Conduit and Dual Lead Wires                |
| 24DR     | 24 VDC, D-Coil, Deutsch                                         |
| 24DR/D   | 24 VDC, D-Coil, Deutsch with Diode                              |



| CODE     | DESCRIPTION                                                     |
|----------|-----------------------------------------------------------------|
| 24DS     | 24 VDC, D-Coil, Dual Spade                                      |
| 24EG     | 24 VDC, E-Coil, DIN 43650                                       |
| 24EJ     | 24 VDC, E-Coil, AMP Jr.                                         |
| 24EL     | 24 VDC, E-Coil, Dual Lead Wires, 18 inches long                 |
| 24EL/36  | 24 VDC, E-Coil, Dual Lead Wires, 36 inches long                 |
| 24EL/W/Z | 24 VDC, E-Coil, Dual Lead Wires with WeatherPak and Zener Diode |
| 24ER     | 24 VDC, E-Coil, Deutsch                                         |
| 24ER/Z   | 24 VDC, E-Coil, Deutsch with Zener Diode                        |
| 24EY     | 24 VDC, E-Coil, Metri-Pack 150                                  |
| 24EY/Z   | 24 VDC, E-Coil, Metri-Pack 150 with Zener Diode                 |
| 36DS     | 36 VDC, D-Coil, Dual Spade                                      |
| 115AG    | 115 VAC, D-Coil, DIN 43650                                      |
| 115AP    | 115 VAC, D-Coil, 1/2" Conduit and Dual Lead Wires               |
| 230AG    | 230 VAC, D-Coil, DIN 43650                                      |
| 230AP    | 230 VAC, D-Coil, 1/2" Conduit and Dual Lead Wires               |

#### M Position Sensor Termination

| CODE  | DESCRIPTION                               |
|-------|-------------------------------------------|
| BLANK | No Position Sensor                        |
| M3    | Neutral Sense, M12-4P, Dual Output NC/NO  |
| N3    | Neutral Sense, DT04-4P, Dual Output NC/NO |