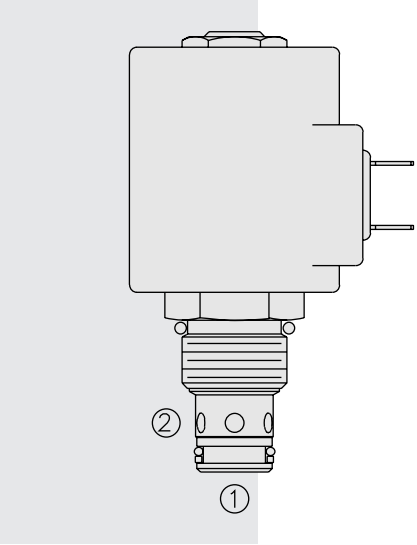
Documentatie
Cartridge kleppen 2/2 - 3/2

SLANGEN SERVICE SPAN SOMEREN BV

Fanatiek in Hydrauliek

De gegevens in deze documentatie zijn met de grootste zorg samengesteld, maar mogen geen reden zijn om ons aansprakelijk te stellen voor de gevolgen van fouten, die ondanks alle controles toch nog zouden kunnen zijn achtergebleven.
Wij behouden ons het recht voor aanvullingen of wijzigingen aan te brengen zonder voorafgaande mededeling te doen.
Uiteraard zijn wij niet beperkt tot dit assortiment, specials kunt u altijd bij ons aanvragen!

SV10-22 Poppet, 2-Way, Normally Closed



DESCRIPTION

A solenoid-operated, 2-way, normally closed, poppet-type, screw-in hydraulic cartridge valve, designed for low leakage blocking and load holding applications.

OPERATION

When de-energized, the **SV10-22** acts as a check valve, allowing flow to pass from 1 to 2, while blocking flow from 2 to 1. With the sensor option, the neutral sensor will signal ON or HIGH.

When energized, the 2 to 1 flow path opens. In this mode, flow is also allowed from 1 to 2. With the sensor option, the neutral sensor will signal LOW or OFF.

Operation of Manual Override Option: To override, push button in, twist counter-clockwise 180° and release. In this position, the valve will remain open.

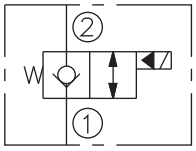
To return to normal operation, push button in, twist clockwise 180° and release. Override will be detented in this position.

FEATURES

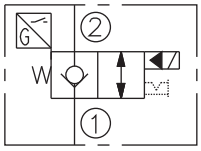
- Continuous-duty rated solenoid.
- Hardened seat for long life and low leakage.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Manual override option.
- Unitized, molded coil design.
- Industry common cavity.

SYMBOLS

ISO:



with Sensor:



RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: 56.8 lpm (15 gpm); see performance chart

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. at 240 bar (3500 psi)

Temperature: with standard Buna N seals: -40 to 100 °C (-40 to 212 °F);
with Fluorocarbon seals: -26 to 204 °C (-15 to 400 °F)

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 40 msec.; De-energized: 32 msec.
Response Time with Sensor: 68 ms pull-in, 50 ms drop-out

Initial Coil Current Draw at 20°C: Standard Coil: 1.67 amps at 12 Vdc;
0.18 amps at 115 Vac (full wave rectified).
E-Coil: 1.7 amps at 12 Vdc; 0.85 amps at 24 Vdc

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-2; See page 9.110.1

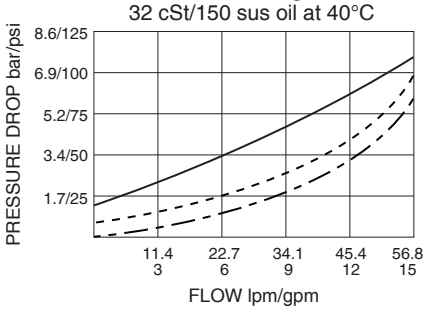
Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kit: SK10-2X-T; See page 8.650.1

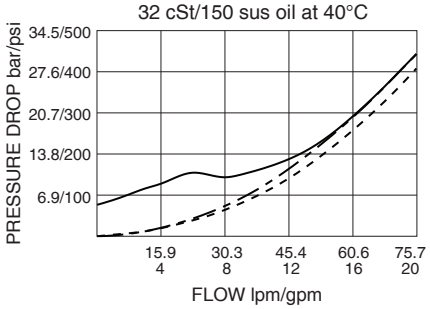
Coil Nut: Part No. 7004400

PERFORMANCE (Cartridge Only)

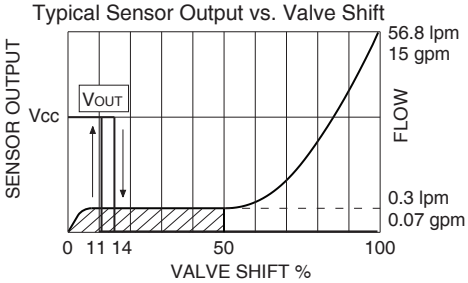
Port 2 to 1 energized - - - - -
Port 1 to 2 energized — - —
Port 1 to 2 de-energized ——
32 cSt/150 sus oil at 40°C



SV10-22 with Sensor
Port 2 to 1 energized - - - - -
Port 1 to 2 energized — - —
Port 1 to 2 de-energized ——
32 cSt/150 sus oil at 40°C



Typical Sensor Output vs. Valve Shift

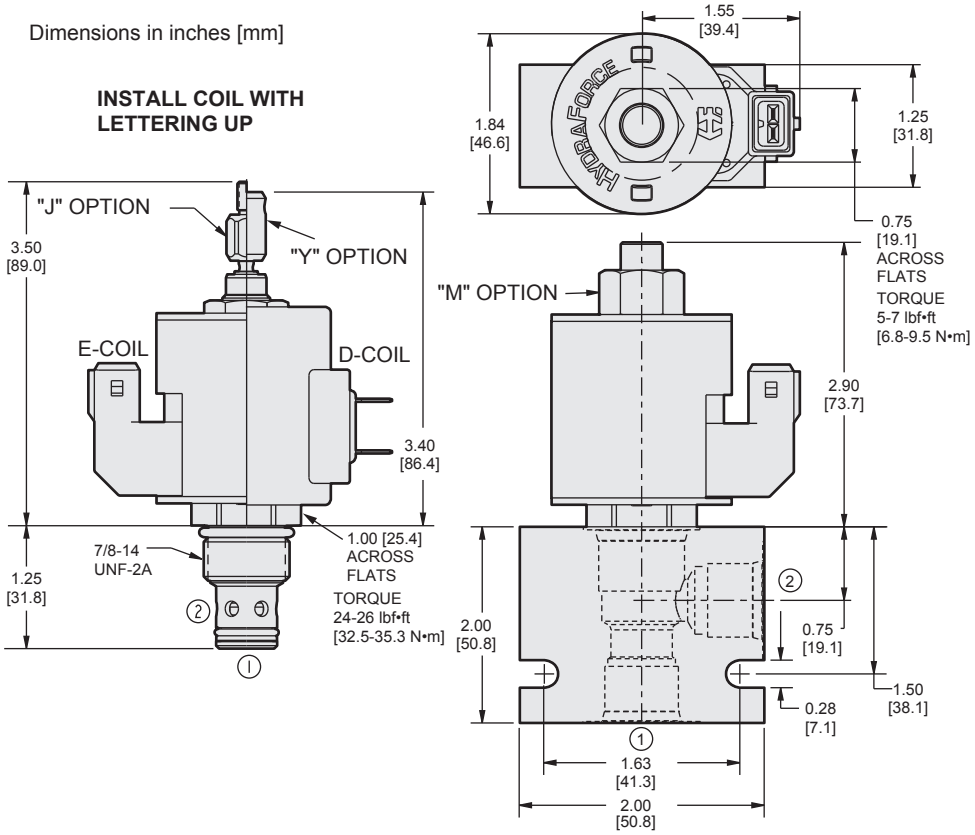


Hatched Area: Overlapping Stroke, Leakage Flow

DIMENSIONS

Dimensions in inches [mm]

INSTALL COIL WITH LETTERING UP



Dimensions will differ significantly with Sensor Option; see page 3.010.1.

MATERIALS

Cartridge: Weight: 0.17 kg (0.37 lb); Weight with Sensor option: 0.49 kg (1.07 lb); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.16 kg (0.35 lb); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; Dimensions may differ. See page 8.010.1.

D-Coil: Weight: 0.27 kg (0.60 lb); Unitized thermoplastic encapsulated, Class H high temperature magnet wire. See page 3.200.1.

E-Coil: Weight: 0.41 kg (0.9 lb); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. See page 3.400.1.

TO ORDER

SV10-(P)22(A)__ - __ __ __ - __ - __ __ __ __ __ - __ __ Sensor Option: See page 3.010.1

Position Indicator

None	(Blank)
Switch	**P**
Restricted Flow	**A**

with sensor, valve is rated 3000 psi (207 bar)

Option

None	(Blank)
Screen	**S**
Manual Override	**M**
Manual Override	**Y**
Manual Override	**J**

For Manual Override options see page 1.001.1

Porting

Cartridge Only	**0**
SAE 8	**8T**
3/8 in. BSP*	**3B**

*BSP Body; U.K. Mfr. Only

Voltage Std. Coil

0	Less Coil**
10	10 Vdc†
12	12 Vdc
24	24 Vdc
36	36 Vdc
48	48 Vdc
24	24 Vac
115	115 Vac
230	230 Vac

**Includes Coil Nut

† DS, DW or DL terminations only

E-Coils: 10,12,20 or 24 Vdc only.

Seals

N	Buna N (Std.)
V	Fluorocarbon

Sensor Type

(Blank)	None
3	Dual Output, N.C./N.O.

Sensor/Connector

(Blank)	None
N	Neutral Sense/DT04-4P
M	Neutral Sense/M12-4P

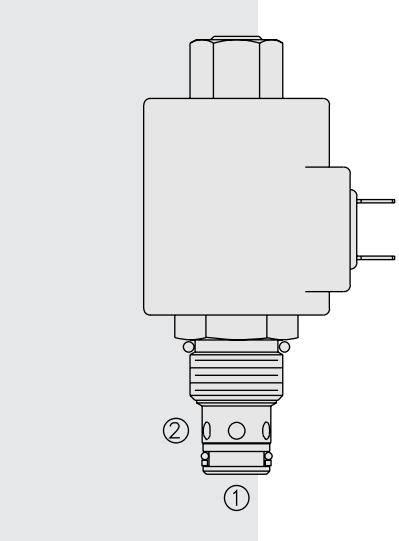
Mating Connectors:
DT06-4S: Part No. 4001953
M12-4S: available at www.turck.com or www.binder-usa.com

Coil Termination	E-Coil	D-Coil
Deutsch DT04-2P	**ER** (IP69K)	**DR** (IP65)
Metri-Pack® 150	**EY** (IP69K)	**DY** (IP65)
Dual Lead Wires	**EL** (IP69K)	**DL** (IP65)
Amp Jr. Timer	**EJ** (IP67)	—
DIN 43650	**EG** (IP65)	**DG** (IP65)
Dual Spades	—	**DS** (IP65)

For Coils with Zener Diode, add "**/Z**" to option code. For example: "**ER/Z**". Not available on all models. See coil option info. on pages 3.200.1 & 3.400.1

Blue rectangles are links to other catalog pages.

SV10-23 Poppet, 2-Way, Normally Open



DESCRIPTION

A solenoid-operated, two-way, poppet-type, normally open, screw-in, hydraulic cartridge valve.

OPERATION

When de-energized, the **SV10-23** allows bidirectional flow from 2 to 1.
With the sensor option, the neutral sensor will signal OFF or LOW.

When energized, the valve's poppet closes to block flow from 2 to 1. In this mode, the cartridge allows free reverse flow from 1 to 2 after overcoming the solenoid force (requires 3.4 to 10.3 bar / 50 to 150 psi). With the sensor option, the neutral sensor will signal ON or HIGH.

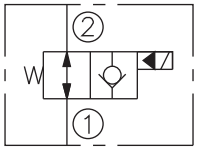
Operation of Manual Override Option: To override, push and hold override button.

FEATURES

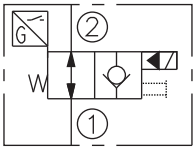
- Continuous-duty rated solenoid.
- Hardened seat for long life and low leakage.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Manual override option.
- Unitized, molded coil design.
- Industry common cavity.

SYMBOLS

ISO:



with Sensor:



RATINGS

Operating Pressure: 207 bar (3000 psi)

Proof Pressure: 345 bar (5000 psi)

Flow: 68.1 lpm (18 gpm); see performance chart

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. at 207 bar (3000 psi)

Temperature: with standard Buna N seals: -40 to 100°C (-40° to 212°F);
with Fluorocarbon seals: -26 to 204°C (-15°F to 400°F)

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 80 msec.; De-energized: 30 msec.
Response Time with Sensor: 158 ms pull-in, 57 ms drop-out

Initial Coil Current Draw at 20°C: Standard Coil: 1.67 amps at 12 VDC; 0.18 amps at 115 VAC (full wave rectified).
E-Coil: 1.7 amps at 12 VDC; 0.85 amps at 24 VDC

Minimum Pull-in Voltage: 85% of nominal at 207 bar (3000 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC10-2; See page 9.110.1

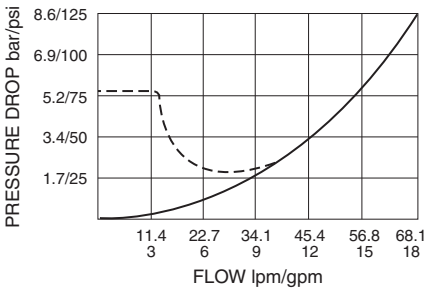
Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kit: SK10-2X-T; See page 8.650.1

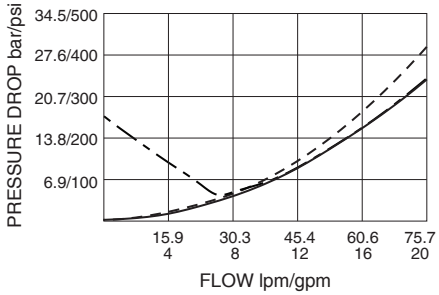
Coil Nut: Part No. 7004420

PERFORMANCE (Cartridge Only)

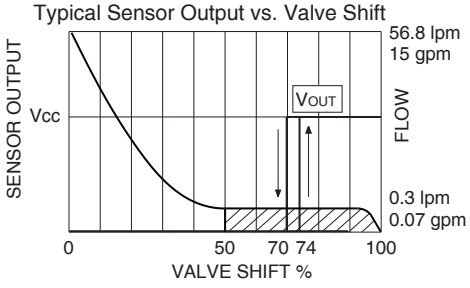
Port 2 to 1 De-energized ——
Port 1 to 2 Energized - - - -
32 cSt/150 sus oil at 40°C



SV10-23 with Sensor
Port 2 to 1 Energized - - - - -
Port 1 to 2 Energized — - —
Port 1 to 2 De-energized ——
32 cSt/150 sus oil at 40°C

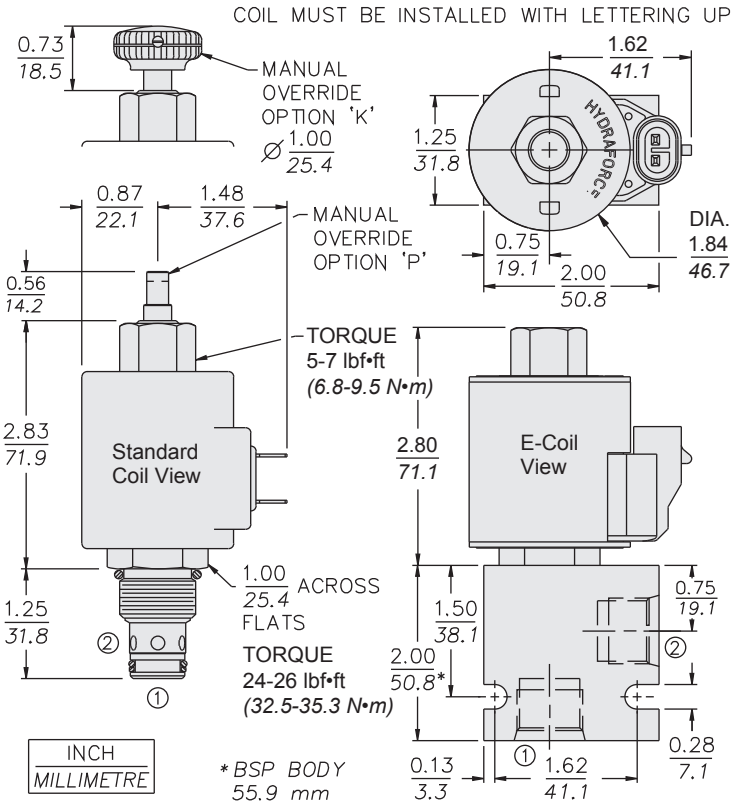


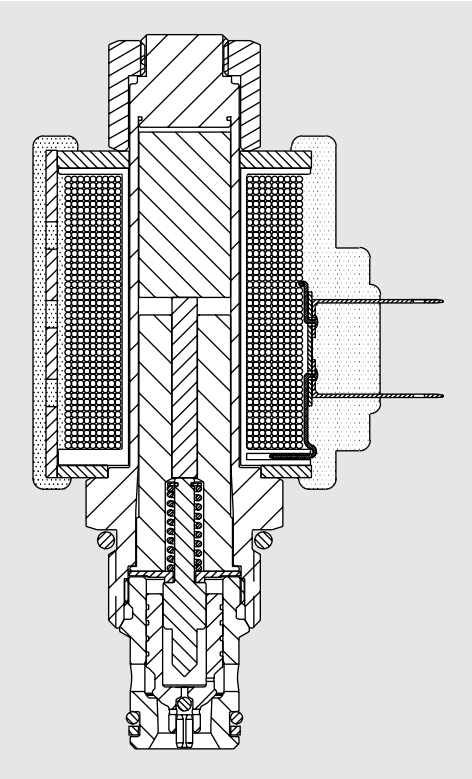
Typical Sensor Output vs. Valve Shift



Hatched Area: Overlapping Stroke, Leakage Flow

DIMENSIONS





Dimensions will differ significantly with Sensor Option; see page 3.010.1.

MATERIALS

Cartridge: Weight: 0.16 kg. (0.35 lbs.); Weight with Sensor option: 0.52 kg. (1.15 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.16 kg. (0.35 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1.

D-Coil: Weight: 0.27 kg. (0.60 lbs.); Unitized thermoplastic encapsulated, Class H high temperature magnetwire. See page 3.200.1.

E-Coil: Weight: 0.41 kg. (0.9 lbs.); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. See page 3.400.1.

TO ORDER

SV10-(P)23(A)__ - __ __ __ - __ - __ __ __ __ __ - Sensor Option: See page 3.010.1

Position Indicator

None	(Blank)
Switch	**P**
Restricted Flow	**A**

Option

None	(Blank)
152µ Screen	**S**
Manual Override	**P**
Manual Override	**K**

For Manual Override options see page 1.001.1

Porting

Cartridge Only	**0**
SAE 8	**8T**
3/8 in. BSP*	**3B**

*BSP Body; U.K. Mfr. Only

Voltage Std. Coil

0	Less Coil**
10	10 VDC†
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
24	24 VAC
115	115 VAC
230	230 VAC

**Includes Coil Nut

† DS, DW or DL terminations only

E-Coils: 10,12,20 or 24 VDC only.

Seals

N	Buna N (Std.)
V	Fluorocarbon

Sensor Type

(Blank)	None
3	Dual Output, N.C./N.O.

Sensor/Connector

(Blank)	None
N	Neutral Sense/DT04-4P
M	Neutral Sense/M12-4P

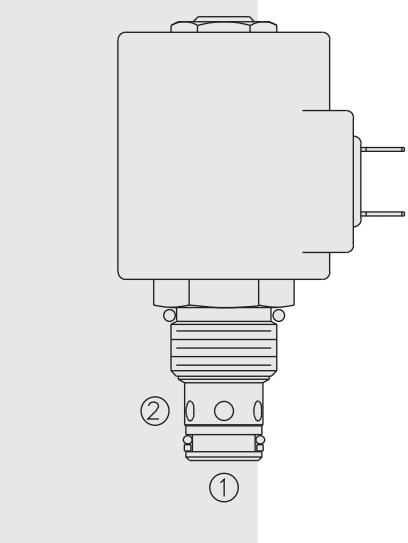
Mating Connectors:
DT06-4S: Part No. 4001953
M12-4S: available at www.turck.com or www.binder-usa.com

Coil Termination	E-Coil	D-Coil
Deutsch DT04-2P	**ER** (IP69K)	**DR** (IP65)
Metri-Pack® 150	**EY** (IP69K)	**DY** (IP65)
Dual Lead Wires	**EL** (IP69K)	**DL** (IP65)
Amp Jr. Timer	**EJ** (IP67)	—
DIN 43650	**EG** (IP65)	**DG** (IP65)
Dual Spades	—	**DS** (IP65)

For Coils with Zener Diode, add "**/Z**" to option code. For example: "**ER/Z**". Not available on all models. See coil option info. on pages 3.200.1 & 3.400.1

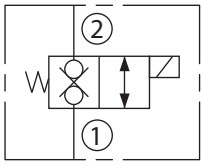
Blue rectangles are links to other catalog pages.

SV10-28 Poppet, 2-Way, N.C., Bi-Directional Blocking

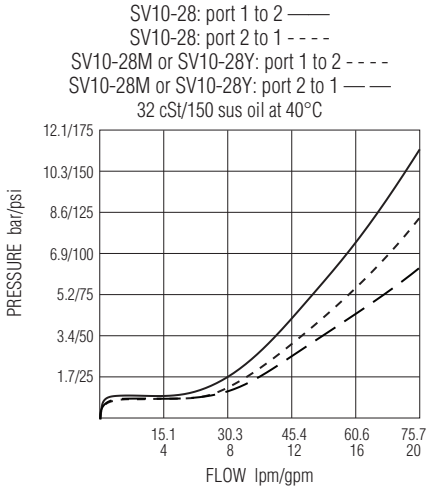


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A solenoid-operated, 2-way, normally closed, internally piloted, poppet-type, bi-directional blocking, screw-in hydraulic cartridge valve, designed for low leakage in load-holding applications.

OPERATION

When de-energized, the **SV10-28** blocks flow in both directions. When energized, the valve's poppet opens on its seat, allowing flow from ② to ① or ① to ②.

FEATURES

- Continuous-duty rated coil.
- Optional coil voltages and terminations.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Hardened seat for long life and low leakage.
- Manual override option.
- Industry common cavity.

RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 75.7 lpm (20 gpm)

Internal Leakage: 0.25 cc/minute (5 drops/minute) max. at 240 bar (3500 psi)

Temperature: -40 to 120 °C with standard Buna seals

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 40 ms.; De-energized: 32 ms.

Initial Coil Current Draw at 20 °C: Standard Coil: 1.67 A at 12 Vdc; 0.18 A at 115 Vac (full wave rectified).
E-Coil: 1.7 A at 12 Vdc; 0.85 A at 24 Vdc

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

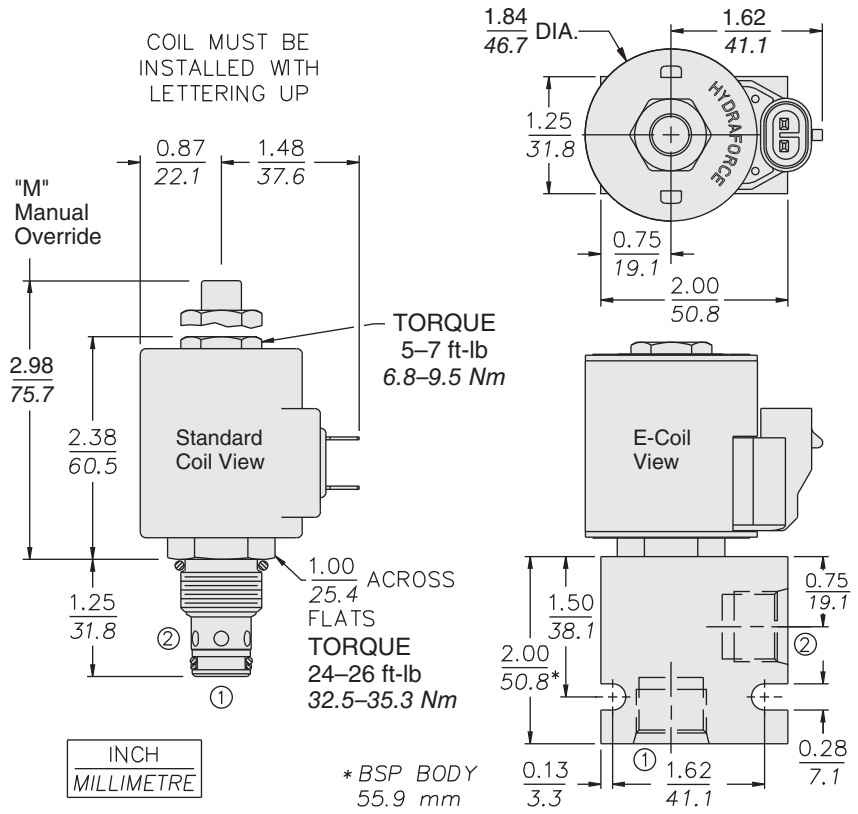
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kit: SK10-2X-M; See page 8.650.1

Coil Nut: Part No. 7004400;
For E-coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg (0.35 lb) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.16 kg (0.35 lb) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ.
See page 8.010.1

Standard Coil: Weight: 0.27 kg (0.60 lb) Unitized thermoplastic encapsulated, Class H high temperature magnetwire.
See page 3.200.1

E-Coil: Weight: 0.41 kg (0.9 lb) Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. **Note: See page 3.400.1 for all E-Coil retrofit applications.**

TO ORDER

SV10-28__ - ___ - __ - ___ ___

Option

None	(Blank)
Manual Override	**M**
Manual Override	**Y**
Manual Override	**J**

For Manual Override options see page 1.001.1

Porting

Cartridge Only	**0**
SAE 8	**8T**
3/8 in. BSP*	**3B**

*BSP Body; U.K. Mfr. Only

Seals

Buna N (Std.)	**N**
Fluorocarbon	**V**

Voltage Std. Coil

0	Less Coil**
10	10 Vdc†
12	12 Vdc
24	24 Vdc
36	36 Vdc
48	48 Vdc
24	24 Vac
115	115 Vac
230	230 Vac

**Includes Std. Coil Nut

† DS, DW or DL terminations only.

E-Coil

10	10 Vdc
12	12 Vdc
20	20 Vdc
24	24 Vdc

Termination (VDC) Std. Coil

DS	Dual Spades
DG	DIN 43650
DL	Leadwires (2)
DL/W	Leads w/Weatherpak® Connectors
DR	Deutsch DT04-2P

Termination (VAC) Std. Coil

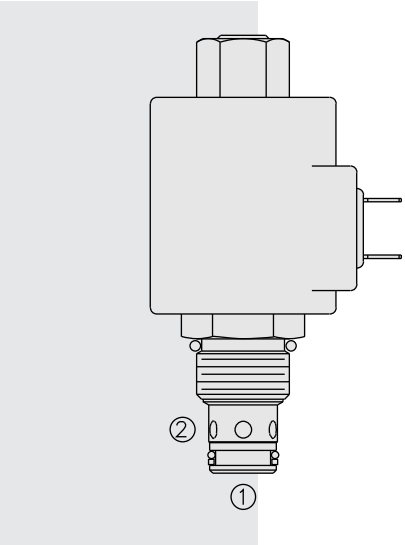
AG	DIN 43650
AP	1/2 in. Conduit

Termination (VDC) E-Coil

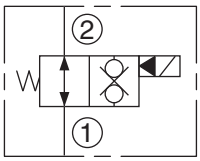
ER	Deutsch DT04-2P (IP69K Rated)
EY	Metri-Pack® 150 (IP69K Rated)

Coils with internal diode are available. Consult factory.

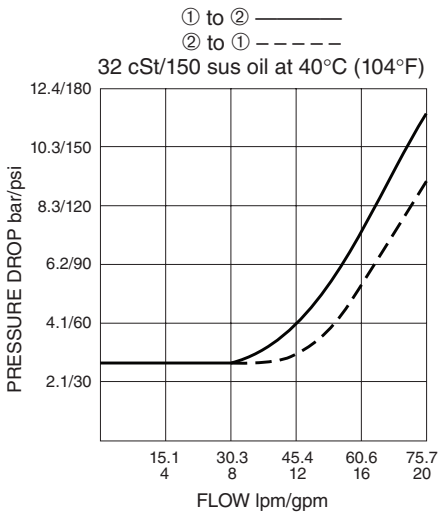
SV10-29 Poppet, 2-Way, N.O., Bi-Directional Blocking



ISO SYMBOL



PERFORMANCE (Cartridge Only)



DESCRIPTION

A solenoid-operated, 2-way, normally open, internally piloted, poppet-type, bi-directional blocking, screw-in hydraulic cartridge valve, designed for low leakage in load-holding applications.

OPERATION

When de-energized, the **SV10-29** allows flow in both directions. When energized, the valve's poppet closes on its seat, blocking flow from 2 to 1 or 1 to 2.

FEATURES

- Bidirectional flow path.
- Manual override option.
- Screen option.
- Continuous-duty rated coil.
- Optional coil voltages and terminations.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Hardened seat for long life and low leakage.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Mimimum Differential Pressure Required: 2.8 bar (40 psi) See Performance Chart.

Flow Rating: 75.7 lpm (20 gpm)

Internal Leakage: 0.25 ml/minute (5 drops/minute) max. at 207 bar (3000 psi)

Temperature: -40 to 120 °C (-40 to 250 °F) with standard Buna seals;
-30 to 205 °C (-20 to 400 °F) with fluorocarbon seals;
-50 to 80 °C (-60 to 175 °F) with polyurethane seals.

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 40 ms; De-energized: 32 ms

Initial Coil Current Draw at 20 °C: Standard Coil: 1.67 amps at 12 Vdc; 0.18 amps at 115 Vac (full wave rectified).
E-Coil: 1.7 amps at 12 Vdc; 0.85 amps at 24 Vdc

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

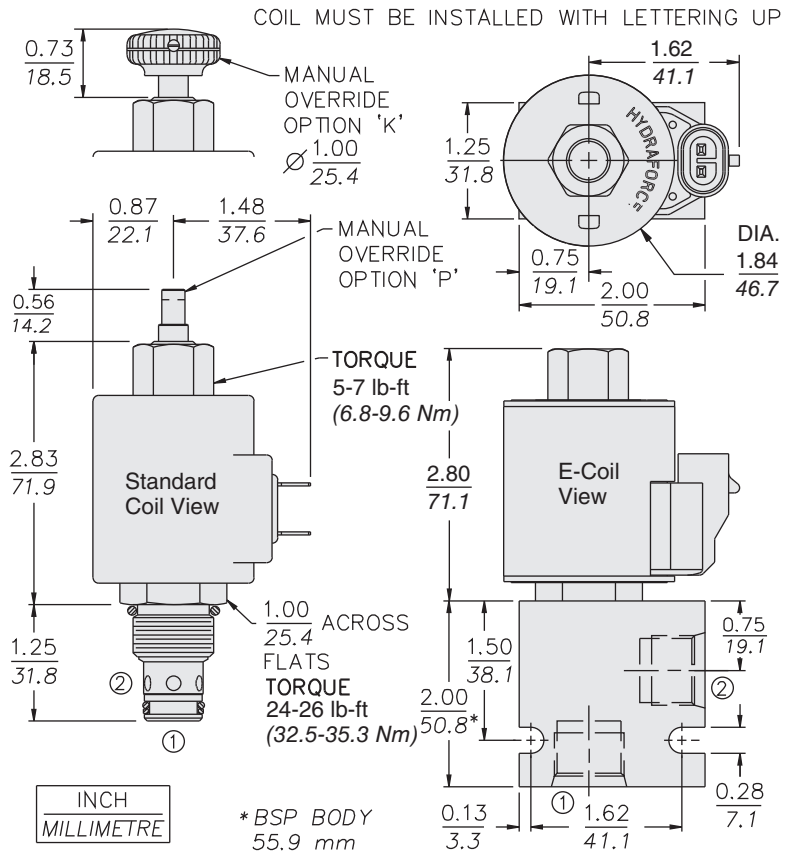
Cavity: VC10-2; See page 9.110.1

Cavity Tool: CT10-2XX; See page 8.600.1

Seal Kit: SK10-2X-M; See page 8.650.1

Coil Nut: Part No. 7004400;
For E-coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.16 kg (0.35 lb) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.16 kg (0.35 lb) Anodized high-strength aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.010.1

Standard Coil: Weight: 0.27 kg (0.60 lb) Unitized thermoplastic encapsulated, Class H high temperature magnet wire. See page 3.200.1

E-Coil: Weight: 0.41 kg (0.9 lb) Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. **Note: See page 3.400.1 for all E-Coil retrofit applications.**

TO ORDER

SV10-29 __ __ - __ __ __ - __ - __ __ __ __ __

Option
None (Blank)
Manual Override without knob **P**
Manual Override with knob **K**
For Manual Override options see page 1.001.1

Screen Option
No Screen (Blank)
Screen **S**

Porting
Cartridge Only **0**
SAE 8 **8T**
3/8 in. BSP* **3B**
*BSP Body; U.K. Mfr. Only

Seals
Buna N (Std.) **N**
Fluorocarbon **V**
Polyurethane **P**

Voltage Std. Coil
0 Less Coil**
10 10 Vdc†
12 12 Vdc
24 24 Vdc
36 36 Vdc
48 48 Vdc
24 24 Vac
115 115 Vac
230 230 Vac
**Includes Std. Coil Nut
† DS, DW or DL terminations only.

E-Coil
10 10 Vdc
12 12 Vdc
20 20 Vdc
24 24 Vdc

Termination (VDC) Std. Coil
DS Dual Spades
DG DIN 43650
DL Leadwires (2)
DL/W Leads w/Weatherpak® Connectors
DR Deutsch DT04-2P

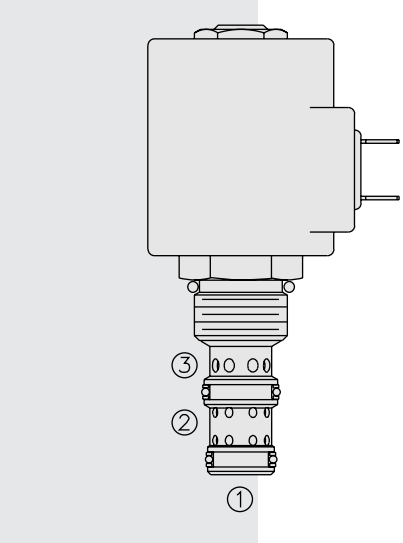
Termination (VAC) Std. Coil
AG DIN 43650
AP 1/2 in. Conduit

Termination (VDC) E-Coil
ER Deutsch DT04-2P (IP69K Rated)
EY Metri-Pack® 150 (IP69K Rated)

Coils with internal diode are available. Consult factory.

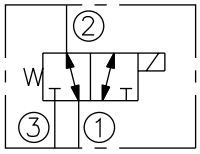
Blue rectangles are links to other catalog pages.

SV10-34 Spool, 3-Way

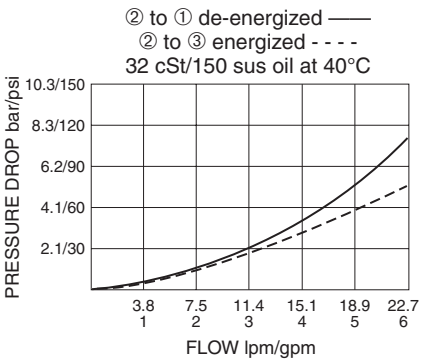


SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



DESCRIPTION

A solenoid-operated, three-way, direct-acting, spool-type, screw-in hydraulic cartridge valve.

OPERATION

When de-energized, the **SV10-34** allows flow from ② to ①, while blocking flow at ③.

When energized, the valve's spool shifts to open from ② to ③, while blocking at ①.

Operation of Manual Override Option: To override, push button in and twist counterclockwise 180°. The internal spring will push the button out. In this position, the valve may be only partially shifted. To assure full override shift, pull the button out to its fullest extension and hold it in this position.

To return to normal valve function, push button in, twist clockwise 180°, and release. Override will be detented in this position.

FEATURES

- Continuous-duty rated solenoid.
- Hardened precision spool and cage for long life.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- All ports may be fully pressurized.
- Cartridges are voltage interchangeable.
- Manual override option.
- Optional waterproof E-Coils rated up to IP69K.
- Unitized, molded coil design.
- Industry common cavity.

RATINGS

Operating Pressure: 207 bar (3000 psi)

Proof Pressure: 350 bar (5075 psi)

Flow: 22.7 lpm (6 gpm) max.; Note: Under certain operating conditions this valve may be rated for higher flow. Consult factory.

Internal Leakage: 115 cc/minute (7 cu. in./minute) max. at 207 bar (3000 psi)

Temperature: -40 to 120 °C with standard Buna seals

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 60 ms; De-energized: 10 ms

Initial Coil Current Draw at 20 °C: Standard Coil: 1.67 A at 12 Vdc; 0.18 A at 115 Vac (full wave rectified).
E-Coil: 1.7 A at 12 Vdc; 0.85 A at 24 Vdc

Minimum Pull-in Voltage: 85% of nominal at 207 bar (3000 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

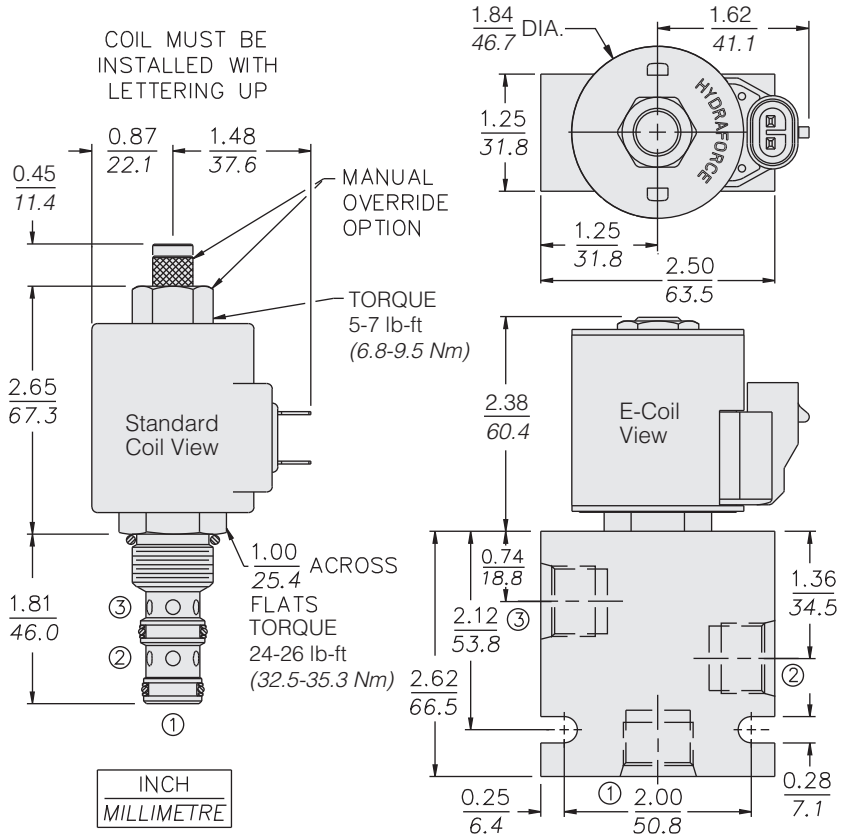
Cavity: VC10-3, See page 9.110.1

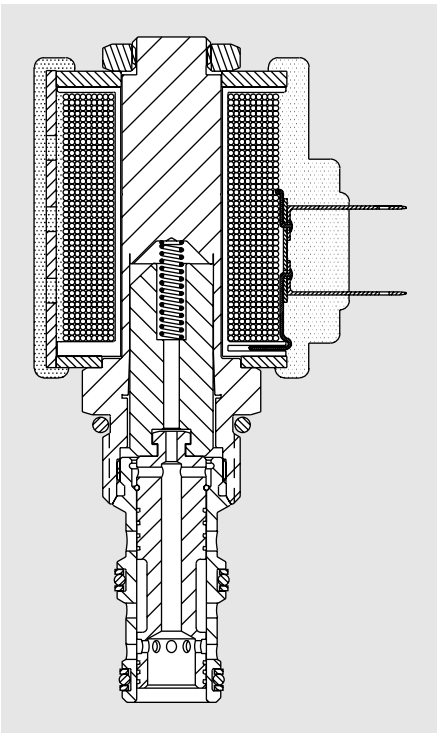
Cavity Tool: CT10-3XX; See page 8.600.1

Seal Kit: SK10-3X-MM; See page 8.650.1

Coil Nut: Part No. 7004400;
For E-coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

DIMENSIONS





MATERIALS

Cartridge: Weight: 0.14 kg (0.30 lb); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.36 kg (0.80 lb); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.008.1.

Standard Coil: Weight: 0.27 kg (0.60 lb); Unitized thermoplastic encapsulated, Class H high temperature magnet wire. See page 3.200.1.

E-Coil: Weight: 0.41 kg (0.9 lb); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. **Note: See page 3.400.1 for all E-Coil retrofit applications.**

TO ORDER

SV10-34__ - __ __ __ - __ - __ __ __ __ __

Option

None	(Blank)
Manual Override	**M**
Manual Override	**Y**
Manual Override	**J**

For Manual Override options see page 1.001.1

Porting

Cartridge Only	**0**
SAE 8	**8T**
3/8 in. BSP*	**3B**

*BSP Body; U.K. Mfr. Only

Seals

Buna N (Std.)	**N**
Fluorocarbon	**V**

Voltage
Std. Coil

0	Less Coil**
10	10 Vdc†
12	12 Vdc
24	24 Vdc
36	36 Vdc
48	48 Vdc
24	24 Vac
115	115 Vac
230	230 Vac

**Includes Std. Coil Nut

† DS, DW or DL terminations only.

E-Coil

10	10 Vdc
12	12 Vdc
20	20 Vdc
24	24 Vdc

Termination (Vdc)
Std. Coil

DS	Dual Spades
DG	DIN 43650
DL	Leadwires (2)
DL/W	Leads w/Weatherpak® Connectors
DR	Deutsch DT04-2P

Termination (Vac)
Std. Coil

AG	DIN 43650
AP	1/2 in. Conduit

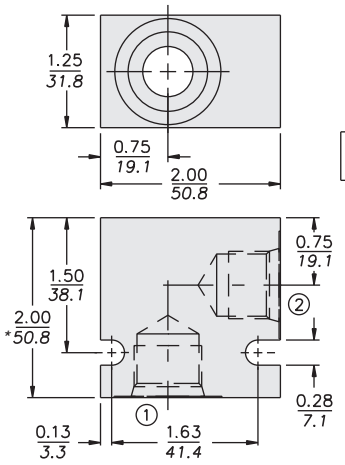
Termination (Vdc)
E-Coil

ER	Deutsch DT04-2P (IP69K Rated)
EY	Metri-Pack® 150 (IP69K Rated)

Coils with internal diode are available. Consult factory.

Series 10 Valve Housings

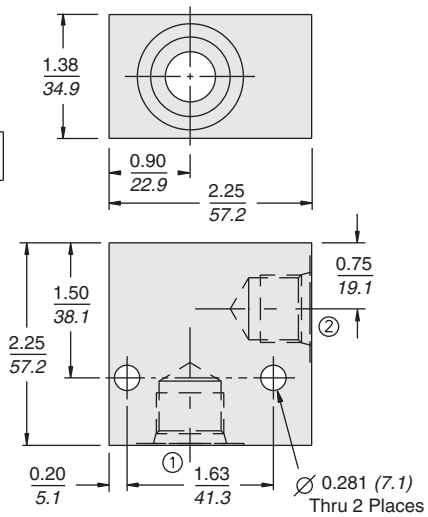
2-WAY
Aluminum



INCH
MILLIMETRE

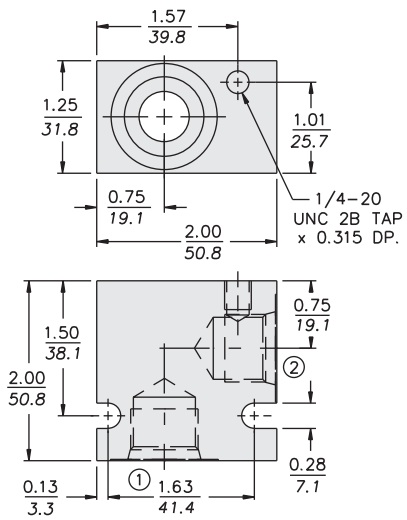
SAE 8 Ported Housing shown

2-WAY
Ductile Iron



SAE 8 Ported Housing shown

2-WAY MR
Aluminum



7026180 – MR
For Lock-Down Bracket Use

Blue Rectangles are links to CAD .stp files.

SERIES 10 2-WAY HOUSINGS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
6T	7024260	Alum.	SAE 6	SAE 6	U.S.
8T	7024280	Alum.	SAE 8	SAE 8	U.S.
2B	7028220	Alum.	1/4" BSP	1/4" BSP	U.K.
3B	7028230	Alum.	3/8" BSP	3/8" BSP	U.K.
4B	7028240	Alum.	1/2" BSP	1/2" BSP	U.K.
6TD	7151400	Duct. Iron	SAE 6	SAE 6	U.S.
8TD	7151410	Duct. Iron	SAE 8	SAE 8	U.S.
3BD	7151440	Duct. Iron	3/8" BSP	3/8" BSP	U.K.
4BD	7151450	Duct. Iron	1/2" BSP	1/2" BSP	U.K.

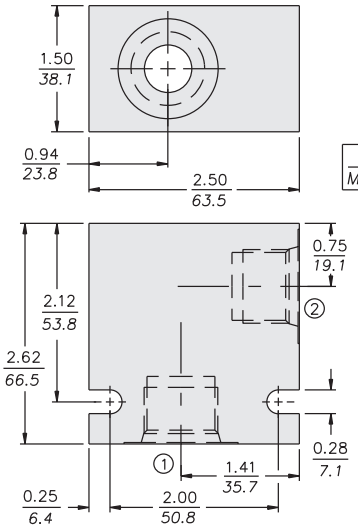
SERIES 10 2-WAY MR HOUSINGS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
8TL	7026180	Alum.	SAE 8	SAE 8	U.S.*

*Drilled and tapped for lock-down bracket

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 10 Valve Housings

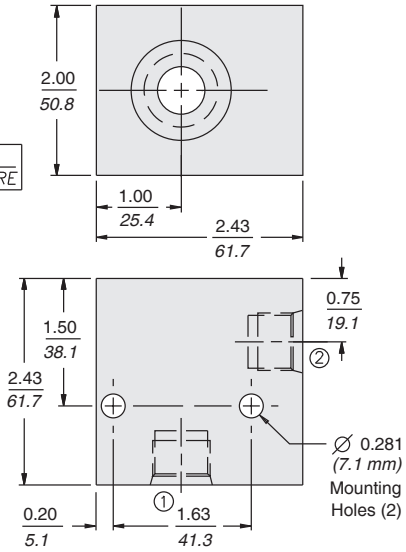
2-WAY with Oversized Ports
Aluminum



7029240 & 7024290

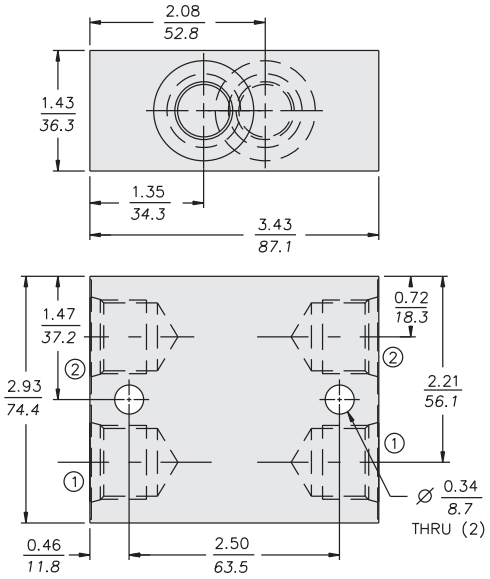
INCH
MILLIMETRE

2-WAY
Ductile Iron - H-Series



7158110 & 7158150

2-WAY Cross-Over
Aluminum



7070170 CRV shown

Blue Rectangles are links to CAD .stp files.

SERIES 10 2-WAY WITH OVERSIZED PORTS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
10T	7029240	Alum.	SAE 10	SAE 10	U.S.
12T	7024290	Alum.	SAE 12	SAE 12	U.S.

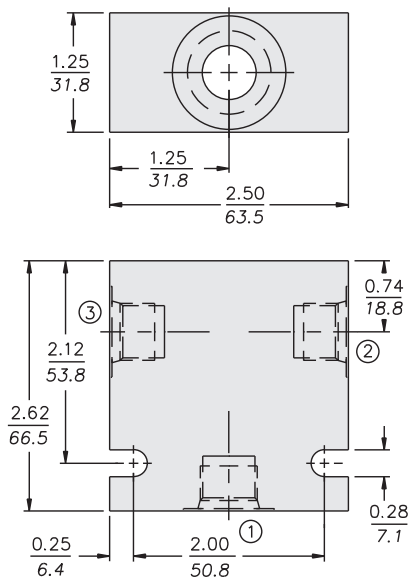
SERIES 10 2-WAY H-SERIES HOUSINGS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
8HT	7158110	Duct. Iron	SAE 8	SAE 8	U.S.
4HB	7158150	Duct. Iron	1/2" BSP	1/2" BSP	U.K.

SERIES 10 2-WAY CROSS-OVER HOUSINGS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
10T	7070170	Alum.	SAE 10 (2)	SAE 10 (2)	U.S.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

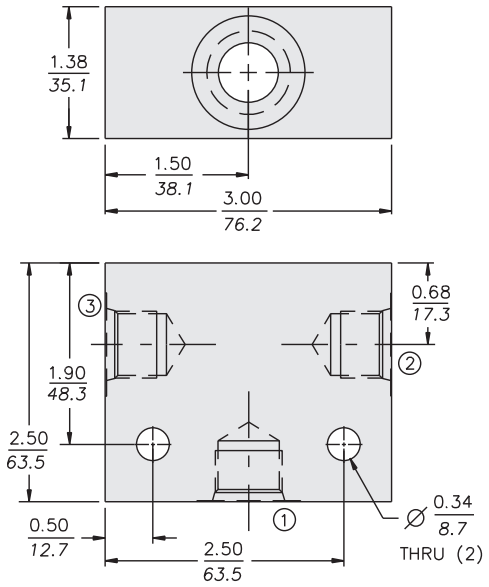
Series 10 Valve Housings

2-WAY Thru-Ported
Aluminum



7025660 & 7025680

2-WAY Thru-Ported with Oversized Ports
Aluminum



7027080 shown

Blue Rectangles are links to CAD .stp files.

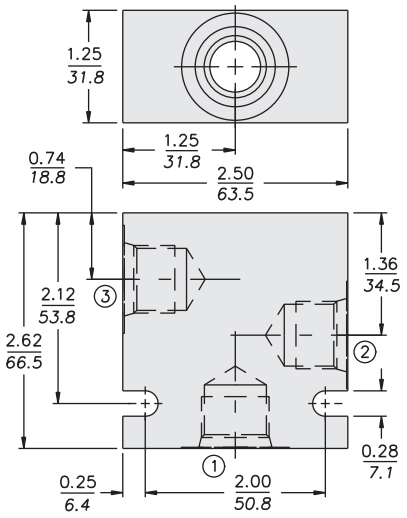
SERIES 10 2-WAY THRU-PORTED HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
6T	7025660	Alum.	SAE 6	SAE 6	SAE 6	U.S.
8T	7025680	Alum.	SAE 8	SAE 8	SAE 8	U.S.

SERIES 10 2-WAY THRU-PORTED WITH OVERSIZED PORTS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
10T	7027080	Alum.	SAE 10	SAE 10	SAE 10	U.S.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

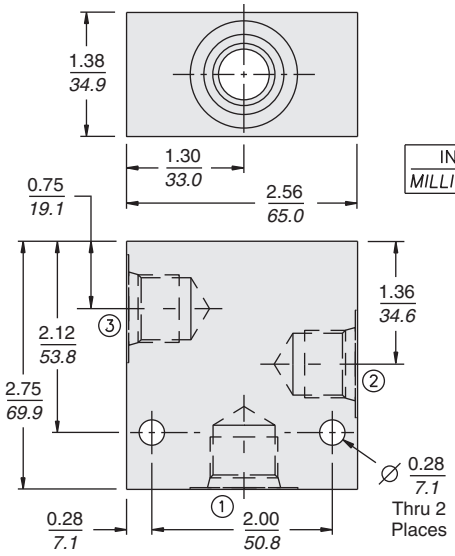
Series 10 Valve Housings

3-WAY
Aluminum



SAE 8 Ported Housing shown

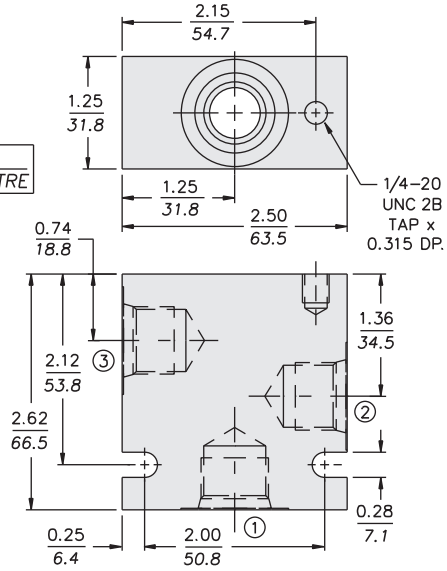
3-WAY
Ductile Iron



SAE 8 Ported Housing shown

3-WAY MR
Aluminum

INCH
MILLIMETRE



7020980 – MR
For Lock-Down Bracket Use

Blue Rectangles are links to CAD .stp files.

SERIES 10 3-WAY HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
6T	7024360	Alum.	SAE 6	SAE 6	SAE 6	U.S.
8T	7024380	Alum.	SAE 8	SAE 8	SAE 8	U.S.
3B	7028330	Alum.	3/8" BSP	3/8" BSP	3/8" BSP	U.K.
6TD	7151500	Duct. Iron	SAE 6	SAE 6	SAE 6	U.S.
8TD	7151510	Duct. Iron	SAE 8	SAE 8	SAE 8	U.S.
3BD	7151540	Duct. Iron	3/8" BSP	3/8" BSP	3/8" BSP	U.K.

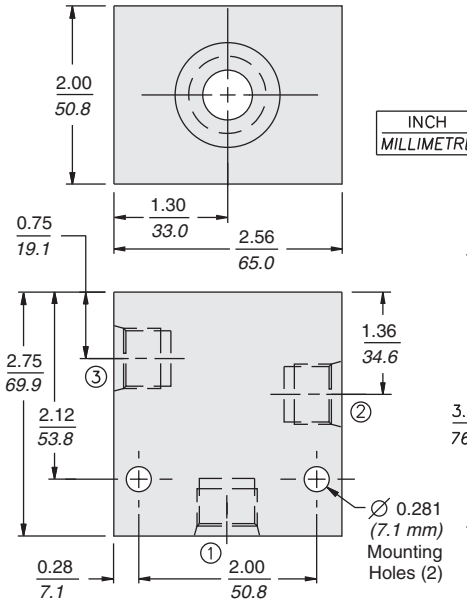
SERIES 10 3-WAY MR HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
8TL	7020980	Alum.	SAE 8	SAE 8	SAE 8	U.S.

*Drilled and tapped for lock-down bracket

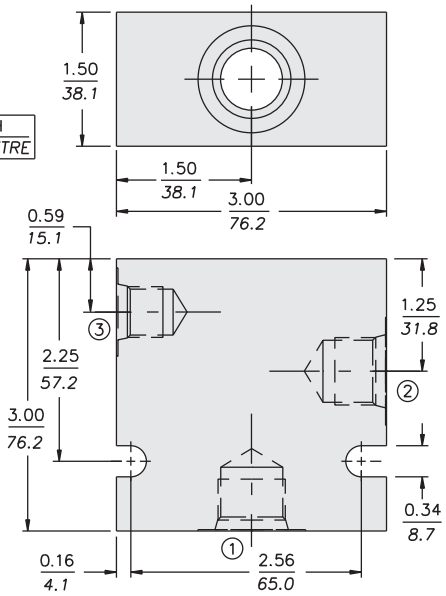
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 10 Valve Housings

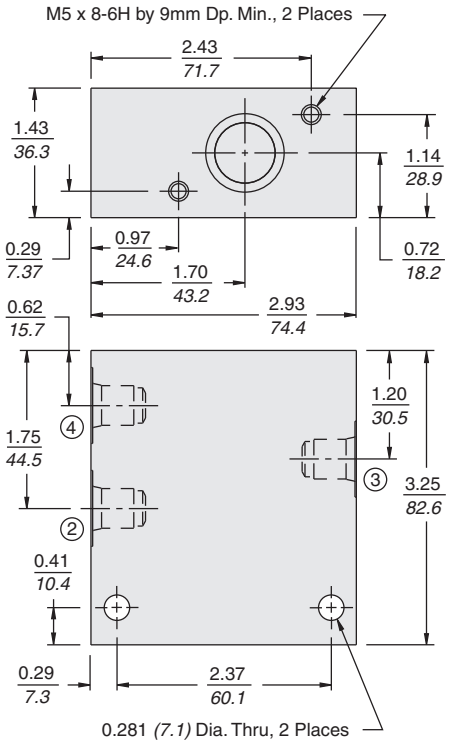
3-WAY
Ductile Iron, H-Series



3-WAY Short
Aluminum or Ductile Iron



3-WAY TS98-T3x Drop-In
Aluminum



Blue Rectangles are links to CAD .stp files.

SERIES 10 3-WAY H-SERIES HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
8HT	7158210	Duct. Iron	SAE 8	SAE 8	SAE 8	U.S.
3HB	7158240	Duct. Iron	3/8" BSP	3/8" BSP	3/8" BSP	U.K.

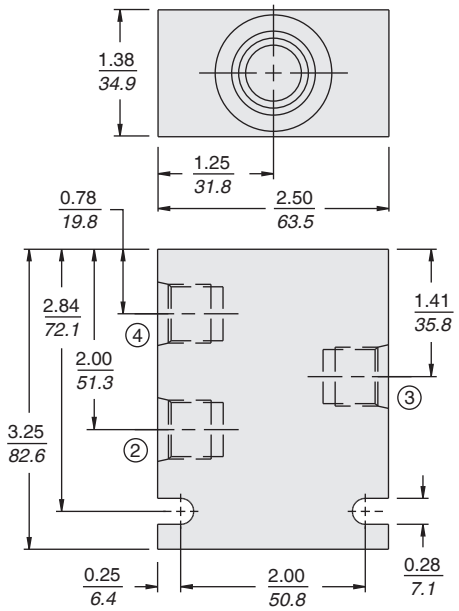
SERIES 10 3-WAY SHORT HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
8T	7026520	Alum.	SAE 8	SAE 8	SAE 6	U.S.
10T	7026530	Alum.	SAE 10	SAE 10	SAE 6	U.S.
8TD	7151610	Duct. Iron	SAE 8	SAE 8	SAE 6	U.S.
10TD	7151620	Duct. Iron	SAE 10	SAE 10	SAE 6	U.S.
3BD	7151650	Duct. Iron	3/8" BSP	3/8" BSP	1/4" BSP	U.K.
4BD	7151660	Duct. Iron	1/2" BSP	1/2" BSP	1/4" BSP	U.K.

SERIES 10 3-WAY TS98-T3x DROP-IN HOUSING						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
6T	7150120	Alum.	SAE 6	SAE 6	SAE 6	U.S.

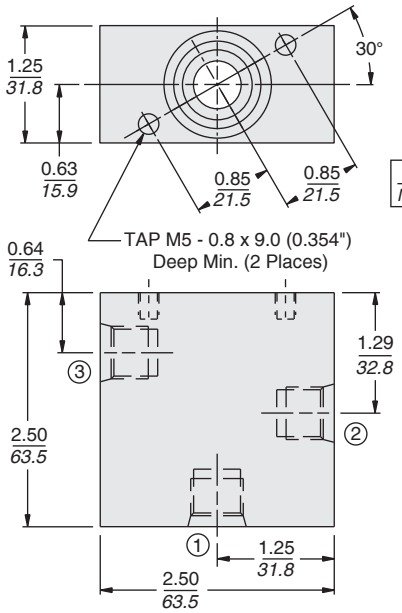
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 10 Valve Housings

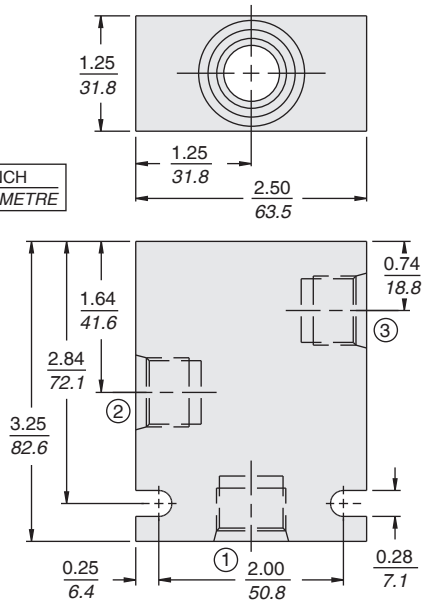
3-WAY TS98-3x
Aluminum



3-WAY 98-T3
Aluminum



3-WAY 10-L3
Aluminum



Blue Rectangles are links to CAD .stp files.

SERIES 10 3-WAY TS98-3x HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
6T	7021680	Alum.	SAE 6	SAE 6	SAE 6	U.S.
8T	7021690	Alum.	SAE 8	SAE 8	SAE 8	U.S.

SERIES 10 3-WAY 98-T3 HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
8T	7024030	Alum.	SAE 8	SAE 8	SAE 8	U.S.

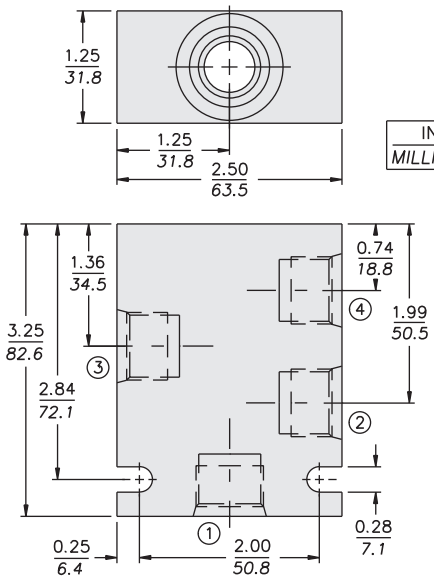
SERIES 10 3-WAY 10-L3 HOUSINGS*						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
6T	7025460	Alum.	SAE 6	SAE 6	SAE 6	U.S.
8T	7025480	Alum.	SAE 8	SAE 8	SAE 8	U.S.

* Used only for ZL70-33 and ZL70-36

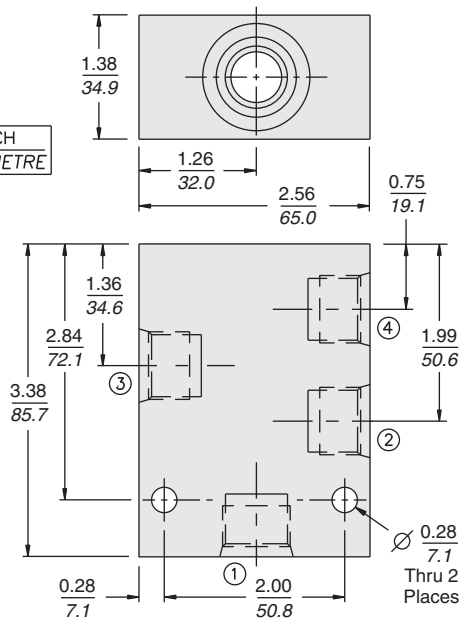
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 10 Valve Housings

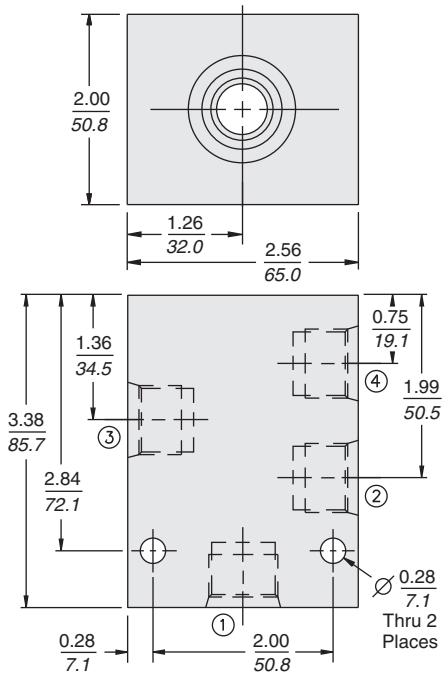
4-WAY
Aluminum



4-WAY
Ductile Iron



4-WAY
Ductile Iron, H-Series



Blue Rectangles are links to CAD .stp files.

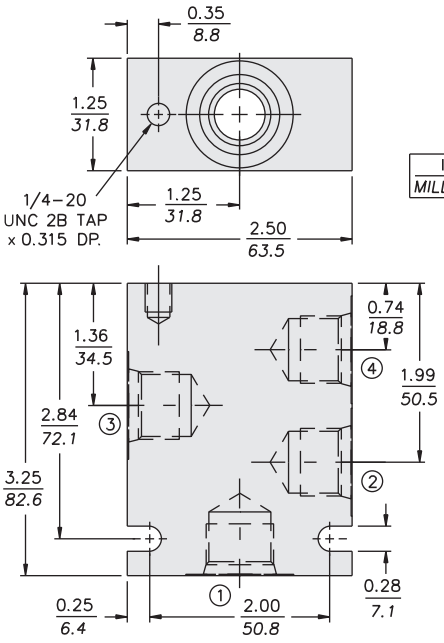
SERIES 10 4-WAY HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
6T 8T	7024460 7024480	Alum. Alum.	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	U.S. U.S.
3B	7028430	Alum.	3/8" BSP	3/8" BSP	3/8" BSP	3/8" BSP	U.K.
6TD 8TD	7151700 7151710	Duct. Iron Duct. Iron	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	U.S. U.S.
3BD	7151740	Duct. Iron	3/8" BSP	3/8" BSP	3/8" BSP	3/8" BSP	U.K.

SERIES 10 4-WAY H-SERIES HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
8HT	7158310	Duct. Iron	SAE 8	SAE 8	SAE 8	SAE 8	U.S.
3HB	7158340	Duct. Iron	3/8" BSP	3/8" BSP	3/8" BSP	3/8" BSP	U.K.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

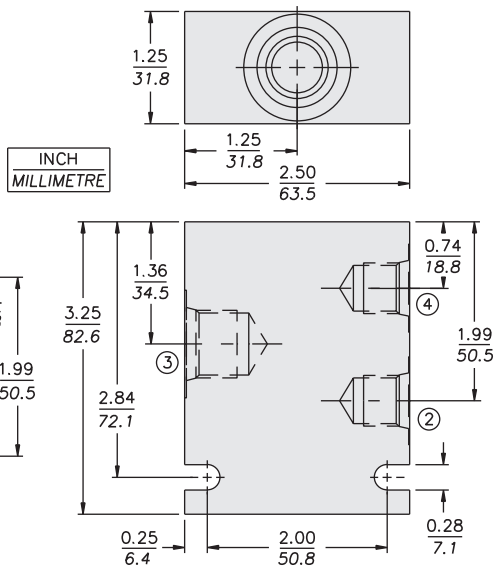
Series 10 Valve Housings

4-WAY MR
Aluminum



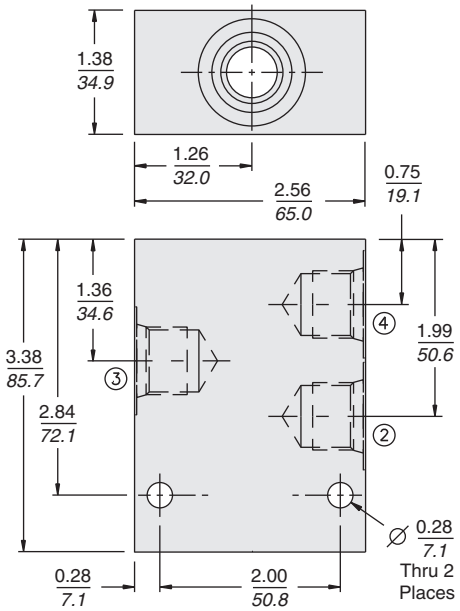
7023380 – MR
For Lock-Down Bracket Use

4-WAY 3-PORT,
Special FD-Type, Aluminum



SAE 8 Ported Housing shown

4-WAY 3-PORT,
Special FD-Type, Ductile Iron



SAE 8 Ported Housing shown

Blue Rectangles are links to CAD .stp files.

SERIES 10 4-WAY MR HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
8TL	7023380	Alum.	SAE 8	SAE 8	SAE 8	SAE 8	U.S.

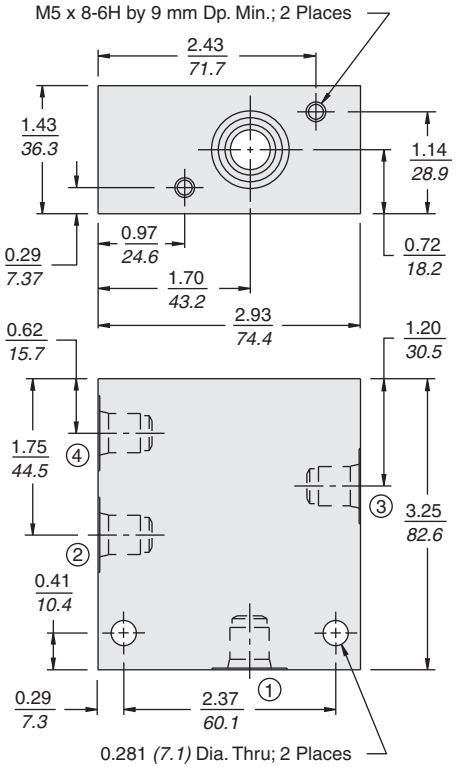
*Drilled and tapped for lock-down bracket

SERIES 10 4-WAY 3-PORTED SPECIAL FD-TYPE HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
6T	7027000	Alum.	—	SAE 6	SAE 6	SAE 6	U.S.
8D	7024980	Alum.	—	SAE 6	SAE 8	SAE 6	U.S.
5B	7028540	Alum.	—	3/8" BSP	1/2" BSP	3/8" BSP	U.K.
6TD	7151900	Duct. Iron	—	SAE 6	SAE 6	SAE 6	U.S.
8TD	7151910	Duct. Iron	—	SAE 8	SAE 8	SAE 8	U.S.
8DD	7151920	Duct. Iron	—	SAE 6	SAE 8	SAE 6	U.S.
3BD	7151940	Duct. Iron	—	3/8" BSP	3/8" BSP	3/8" BSP	U.K.

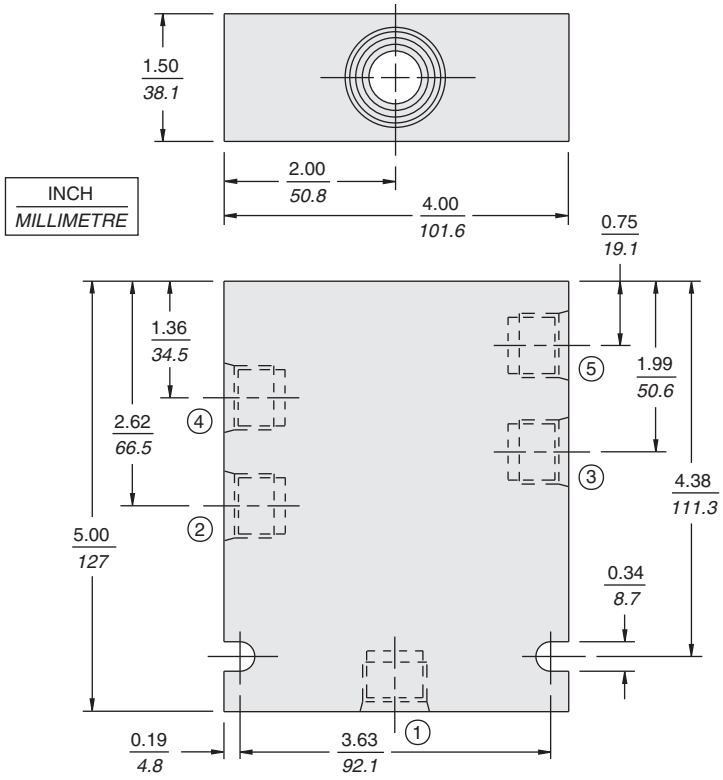
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 10 Valve Housings

4-WAY SV98-T40
Aluminum



5-WAY
Aluminum



Blue Rectangles are links to CAD .stp files.

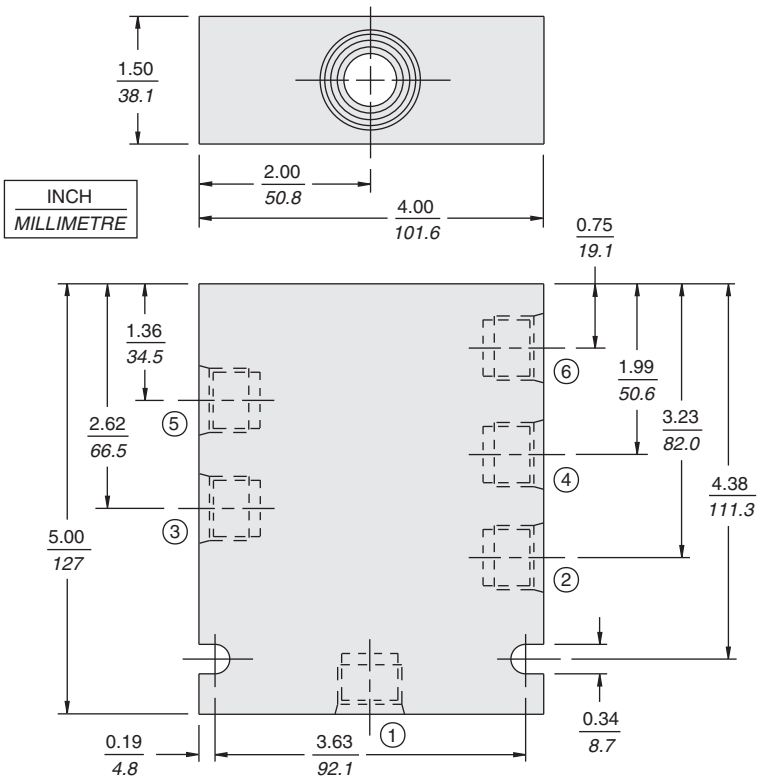
SERIES 10 4-WAY SV98-T40 HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
8T	7150030	Alum.	SAE 8	SAE 8	SAE 8	SAE 8	U.S.

SERIES 10 5-WAY HOUSINGS								
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Port 5**	**Mfg. Loc.**
6T	7022820	Alum.	SAE 6	SAE 6	SAE 6	SAE 6	SAE 6	U.S.
8T	7022830	Alum.	SAE 8	SAE8	SAE 8	SAE 8	SAE 8	U.S.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 10 Valve Housings

6-WAY
Aluminum



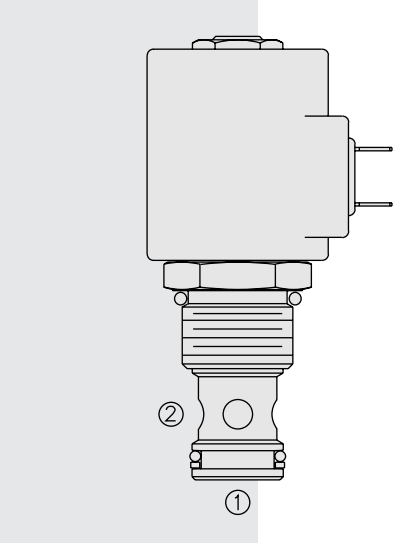
Blue Rectangles are links to CAD .stp files.

SERIES 10 6-WAY HOUSINGS									
Code	Part No.	Material	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Mfg. Loc.
6T 8T	4553010 4559030	Alum. Alum.	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	SAE 6 SAE 8	U.S. U.S.
3B	4552990	Alum.	3/8" BSP	3/8" BSP	3/8" BSP	3/8" BSP	3/8" BSP	3/8" BSP	U.K.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	OPERATING PRESSURE	PORTS	MFG. LOCATION
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Blue rectangles are links to other catalog pages.

SV12-22 Poppet, 2-Way, Normally Closed



DESCRIPTION

A solenoid-operated, 2-way, 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 **SV12-22** acts as a check valve, allowing flow to pass from 1 to 2, while blocking flow in the reverse direction.

When energized, the poppet lifts to open the 2 to 1 flow path. In this mode, flow is also allowed from 1 to 2.

Operation of Manual Override Option: To override, push button in, twist counter-clockwise 180° and release. In this position, the valve will remain open.

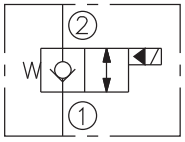
To return to normal operation, push button in, twist clockwise 180° and release. Override will be detented in this position.

FEATURES

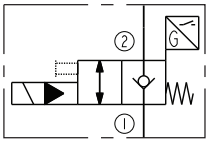
- Continuous-duty rated solenoid.
- Hardened seat for long life and low leakage.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Unitized, molded coil design.
- Manual override option.
- Optional waterproof E-Coils rated up to IP69K.
- Cost effective cavity.

SYMBOLS

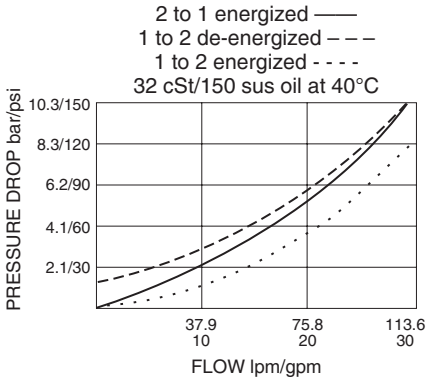
ISO:

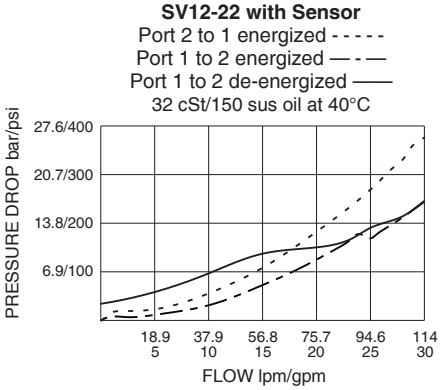


with Sensor:



PERFORMANCE (Cartridge Only)





RATINGS

Operating Pressure: 240 bar (3500 psi)

Proof Pressure: 390 bar (5700 psi)

Flow: 114 lpm (30 gpm); see performance chart

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. at 240 bar (3500 psi)

Temperature: -40 to 120 °C with standard Buna seals

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 40 ms; De-energized: 80 ms

Initial Coil Current Draw at 20 °C: Standard Coil: 1.67 amps at 12 Vdc; 0.18 amps at 115 Vac (full wave rectified).
E-Coil: 1.7 amps at 12 Vdc; 0.85 amps at 24 Vdc

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

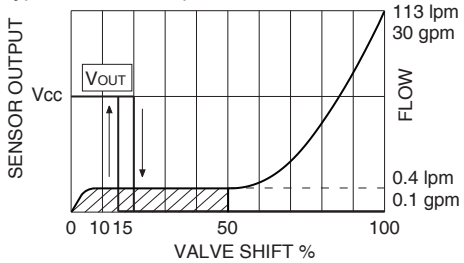
Cavity: VC12-2; See page 9.112.1

Cavity Tool: CT12-2XX; See page 8.600.1

Seal Kit: SK12-2X-T; See page 8.650.1

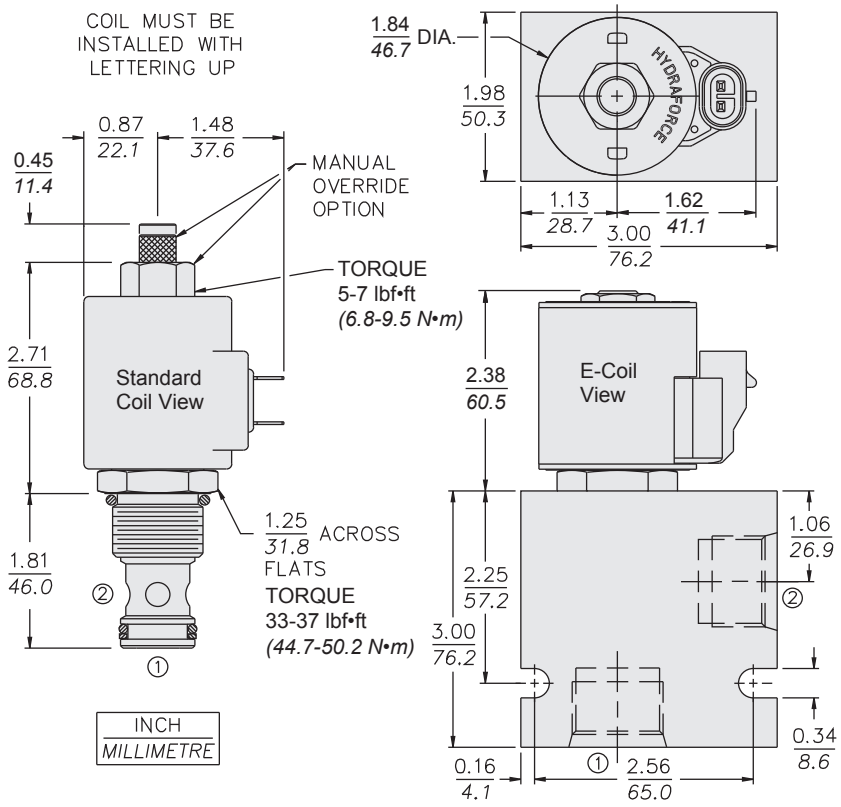
Coil Nut: Part No. 7004400;
For E-coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

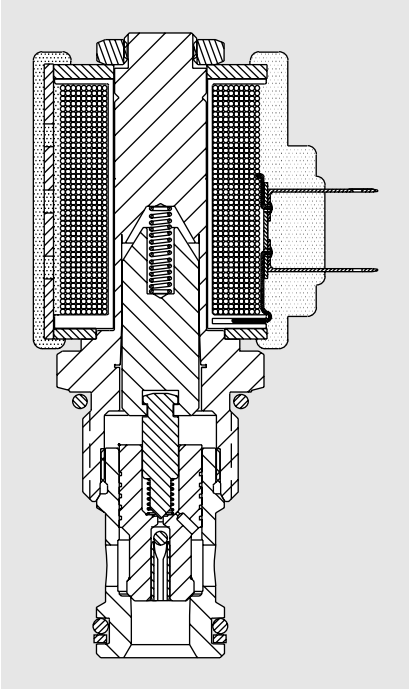
Typical Sensor Output & Flow vs. Valve Shift



Hatched Area: Overlapping Stroke, Leakage Flow

DIMENSIONS





Dimensions will differ significantly with Sensor Option; see page 3.010.1.

MATERIALS

Cartridge: Weight: 0.25 kg (0.55 lb) Weight with sensor option: 0.58 kg (1.28 lb); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.57 kg (1.25 lb) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

Standard Coil: Weight: 0.27 kg (0.60 lb); Unitized thermoplastic encapsulated, Class H high temperature magnet wire; See page 3.200.1.

E-Coil: Weight: 0.41 kg (0.9 lb); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. See page 3.400.1.

TO ORDER

SV12-(P)22(A)__ - __ __ __ - __ - __ __ __ __ __ - Sensor Option: See page 3.010.1

Position Indicator
None (Blank)
Switch **P**
Restricted Flow **A**
with sensor, valve is rated 3000 psi (207 bar)

Option
None (Blank)
Manual Override **M**
Manual Override **Y**
Manual Override **J**
For Manual Override options see page 1.001.1

Porting
Cartridge Only **0**
SAE 12 **12T**

Voltage Std. Coil
0 Less Coil**
10 10 Vdc†
12 12 Vdc
24 24 Vdc
36 36 Vdc
48 48 Vdc
24 24 Vac
115 115 Vac
230 230 Vac
**Includes Coil Nut
† DS, DW or DL terminations only
E-Coils: 10,12,20 or 24 Vdc only.

Seals
N Buna N (Std.)
V Fluorocarbon

Sensor Type
(Blank) None
3 Dual Output, N.C./N.O.

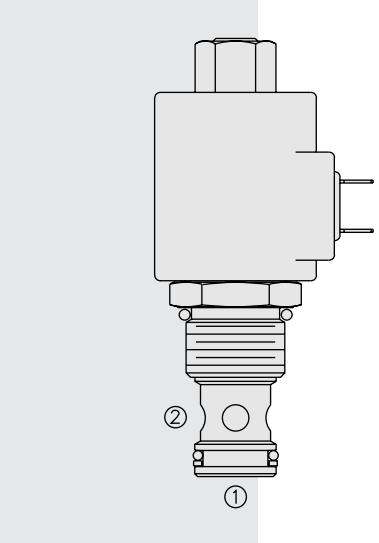
Sensor/Connector
(Blank) None
N Neutral Sense/DT04-4P
M Neutral Sense/M12-4P
Mating Connectors:
DT06-4S: Part No. 4001953
M12-4S: available at www.turck.com or www.binder-usa.com

Coil Termination	E-Coil	D-Coil
Deutsch DT04-2P	**ER** (IP69K)	**DR** (IP65)
Metri-Pack® 150	**EY** (IP69K)	**DY** (IP65)
Dual Lead Wires	**EL** (IP69K)	**DL** (IP65)
Amp Jr. Timer	**EJ** (IP67)	—
DIN 43650	**EG** (IP65)	**DG** (IP65)
Dual Spades	—	**DS** (IP65)

For Coils with Zener Diode, add "**/Z**" to option code. For example: "**ER/Z**" Not available on all models. See coil option info. on pages 3.200.1 & 3.400.1

Blue rectangles are links to other catalog pages.

SV12-23 Poppet, 2-Way, Normally Open



DESCRIPTION

A solenoid-operated, two-way, normally open, 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 **SV12-23** allows bidirectional flow from 2 to 1.
With the sensor option, the neutral sensor will signal OFF or LOW.

When energized, the valve's poppet closes to block flow from 2 to 1. In this mode, the cartridge allows free reverse flow from 1 to 2 after overcoming the solenoid force (requires 3.4 to 10.3 bar / 50 to 150 psi). With the sensor option, the neutral sensor will signal ON or HIGH.

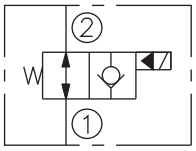
Operation of Manual Override Option: To override, push and hold override button.

FEATURES

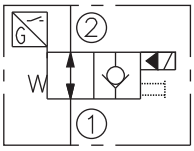
- Continuous-duty rated solenoid.
- Hardened seat for long life and low leakage.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Unitized, molded coil design.
- Manual override option.
- Cost effective cavity.

SYMBOLS

ISO:



with Sensor:



RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: Up to 114 lpm (30 gpm); see performance chart

Internal Leakage: 0.15 cc/minute (3 drops/minute) max. at 240 bar (3500 psi)

Temperature: with standard Buna N seals: -40 to 100°C (-40° to 212°F);
with Fluorocarbon seals: -26 to 204°C (-15°F to 400°F)

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 80 msec.; De-energized: 30 msec.
Response Time with Sensor: 158 ms pull-in, 57 ms drop-out

Initial Coil Current Draw at 20°C: Standard Coil: 1.67 amps at 12 VDC; 0.18 amps at 115 VAC (full wave rectified).
E-Coil: 1.7 amps at 12 VDC; 0.85 amps at 24 VDC

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-2; See page 9.112.1

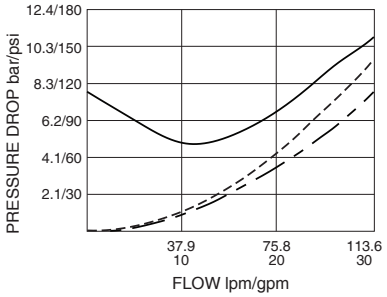
Cavity Tool: CT12-2XX; See page 8.600.1

Seal Kit: SK12-2X-T; See page 8.650.1

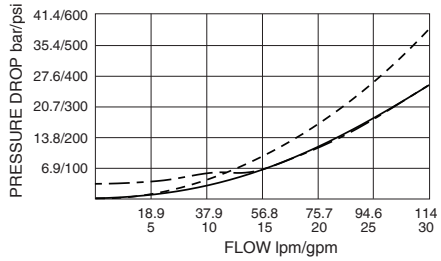
Coil Nut: Part No. 7004420

PERFORMANCE (Cartridge Only)

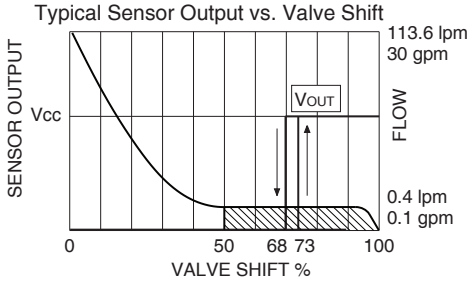
Port 2 to 1 De-energized - - - - -
Port 1 to 2 De-energized — - —
Port 1 to 2 Energized ——
32 cSt/150 sus oil at 40°C



SV12-23 with Sensor
Port 2 to 1 Energized - - - - -
Port 1 to 2 Energized — - —
Port 1 to 2 De-energized ——
32 cSt/150 sus oil at 40°C

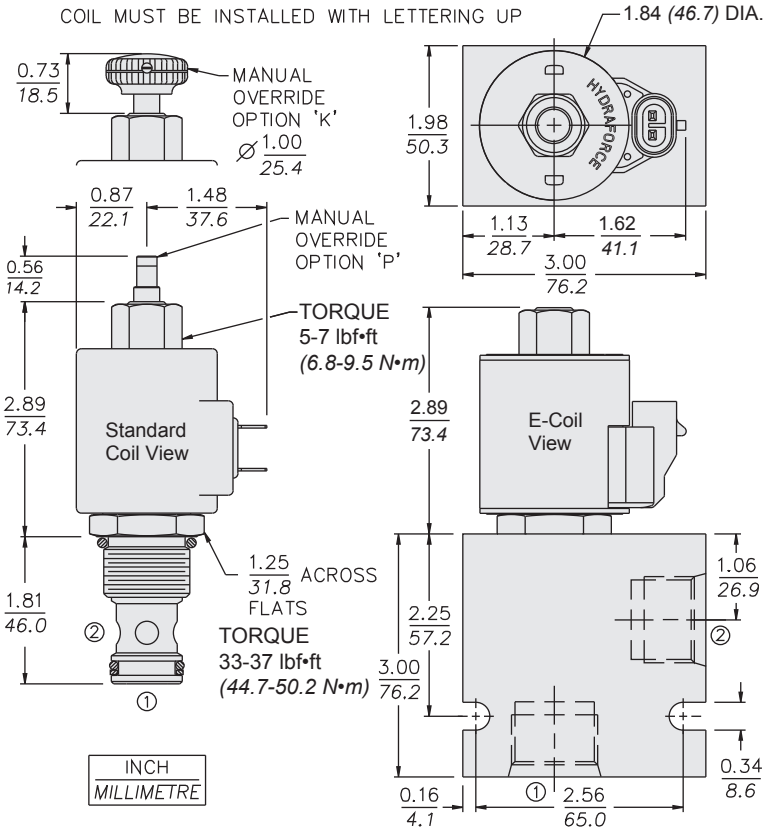


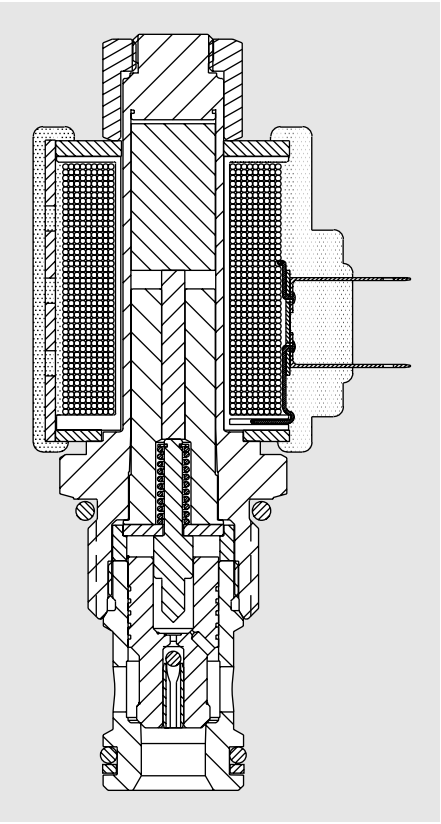
Typical Sensor Output vs. Valve Shift



Hatched Area: Overlapping Stroke, Leakage Flow

DIMENSIONS





Dimensions will differ significantly with Sensor Option; see page 3.010.1.

MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.); Weight with Sensor option: 0.61 kg. (1.35 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.57kg. (1.25 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

D-Coil: Weight: 0.27 kg. (0.60 lbs.); Unitized thermoplastic encapsulated, Class H high temperature magnetwire. See page 3.200.1.

E-Coil: Weight: 0.41 kg. (0.9 lbs.); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. See page 3.400.1.

TO ORDER

SV12-(P)23(A)__ - __ __ __ - __ - __ __ __ __ __ - __ __ Sensor Option: See page 3.010.1

Position Indicator
None (Blank)
Switch **P**
Restricted Flow **A**
with sensor, valve is rated 3000 psi (207 bar)

Option
None (Blank)
Manual Override **P**
Manual Override **K**
For Manual Override options see page 1.001.1

Porting
Cartridge Only **0**
SAE 12 **12T**

Voltage Std. Coil
0 Less Coil**
10 10 VDC†
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
24 24 VAC
115 115 VAC
230 230 VAC
**Includes Coil Nut
† DS, DW or DL terminations only
E-Coils: 10,12,20 or 24 VDC only.

Seals
N Buna N (Std.)
V Fluorocarbon

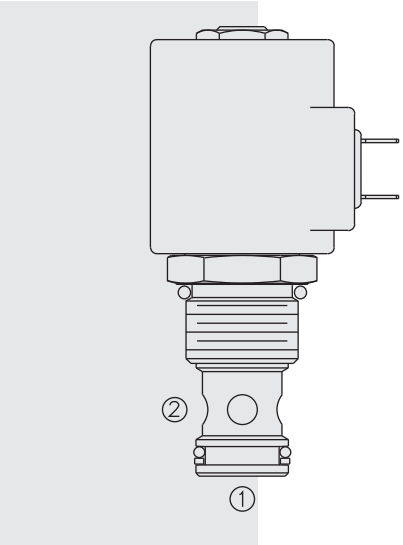
Sensor Type
(Blank) None
3 Dual Output, N.C./N.O.

Sensor/Connector
(Blank) None
N Neutral Sense/DT04-4P
M Neutral Sense/M12-4P
Mating Connectors:
DT06-4S: Part No. 4001953
M12-4S: available at www.turck.com or www.binder-usa.com

Coil Termination	E-Coil	D-Coil
Deutsch DT04-2P	**ER** (IP69K)	**DR** (IP65)
Metri-Pack® 150	**EY** (IP69K)	**DY** (IP65)
Dual Lead Wires	**EL** (IP69K)	**DL** (IP65)
Amp Jr. Timer	**EJ** (IP67)	—
DIN 43650	**EG** (IP65)	**DG** (IP65)
Dual Spades	—	**DS** (IP65)

For Coils with Zener Diode, add "**/Z**" to option code. For example: "**ER/Z**". Not available on all models. See coil option info. on pages 3.200.1 & 3.400.1

SV12-28 Poppet, 2-Way, N.C., Bi-Directional Blocking



DESCRIPTION

A solenoid-operated, two-way, normally closed, internally piloted, poppet-type, bi-directional blocking, screw-in hydraulic cartridge valve, designed for low leakage in load-holding applications.

OPERATION

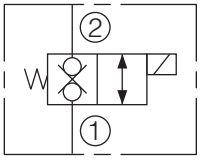
When de-energized, the **SV12-28** blocks flow in both directions. When energized, the valve's poppet opens on its seat, allowing flow from ② to ① or ① to ②.

FEATURES

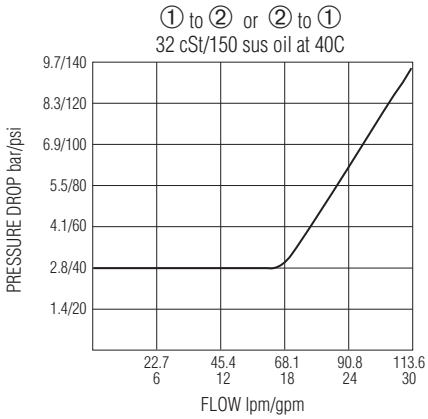
- Continuous-duty rated coil.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Manual Override option.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Hardened seat for long life and low leakage.
- Unitized, molded coil design.
- Cost-effective cavity.

SYMBOLS

USASI/ISO:



PERFORMANCE (Cartridge Only)



RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 113.6 lpm (30 gpm)

Internal Leakage: 7 drops per minute maximum at 240 bar (3500 psi)

Temperature: -40 to 120 °C with standard Buna seals

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 40 msec.; De-energized: 32 msec.

Initial Coil Current Draw at 20 °C: Standard Coil: 1.67 amps at 12 Vdc; 0.18 amps at 115 Vac (full wave rectified).
E-Coil: 1.7 amps at 12 Vdc; 0.85 amps at 24 Vdc

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-2; See page 9.112.1

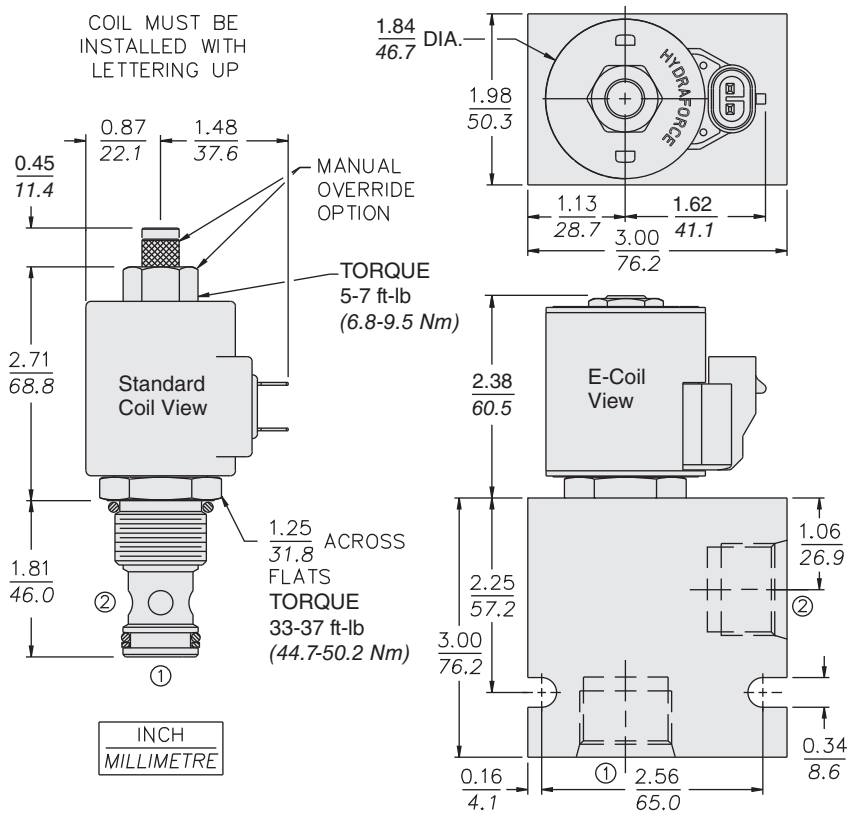
Cavity Tool: CT12-2XX; See page 8.600.1

Seal Kit: SK12-2X-M; See page 8.650.1

Coil Nut: Part No. 7004400

For E-Coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.25 kg (0.55 lb) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.57 kg (1.25 lb) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ.
See page 8.012.1.

Standard Coil: Weight: 0.27 kg (0.60 lb); Unitized thermoplastic encapsulated, Class H high temperature magnet wire;
See page 3.200.1.

E-Coil: Weight: 0.41 kg (0.9 lb); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors.
Note: See page 3.400.1 for all E-Coil retrofit applications.

TO ORDER

SV12-28__ - ___ ___ - __ - ___ ___ ___ ___ ___

Option

None	(Blank)
Manual Override	**M**
Manual Override	**Y**
Manual Override	**J**

For Manual Override options see page 1.001.1

Porting

Cartridge Only	**0**
SAE 12	**12T**

Seals

Buna N (Std.)	**N**
Fluorocarbon	**V**

Voltage
Std. Coil

0	Less Coil**
10	10 Vdc†
12	12 Vdc
24	24 Vdc
36	36 Vdc
48	48 Vdc
24	24 Vac
115	115 Vac
230	230 Vac

**Includes Std. Coil Nut

† DS, DW or DL terminations only.

E-Coil

10	10 Vdc
12	12 Vdc
20	20 Vdc
24	24 Vdc

Termination (Vdc)
Std. Coil

DS	Dual Spades
DG	DIN 43650
DL	Leadwires (2)
DL/W	Leads w/Weatherpak® Connectors
DR	Deutsch DT04-2P

Termination (Vac)
Std. Coil

AG	DIN 43650
AP	1/2 in. Conduit

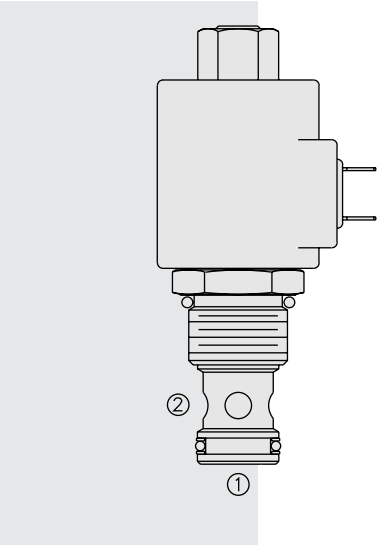
Termination (Vdc)
E-Coil

ER	Deutsch DT04-2P (IP69K Rated)
EY	Metri-Pack® 150 (IP69K Rated)

Coils with internal diode are available. Consult factory.

Blue rectangles are links to other catalog pages.

SV12-29 Poppet, 2-Way, N.O., Bi-Directional Blocking



DESCRIPTION

A solenoid-operated, two-way, normally open, internally piloted, poppet-type, bi-directional blocking, screw-in hydraulic cartridge valve, designed for low leakage in load-holding applications.

OPERATION

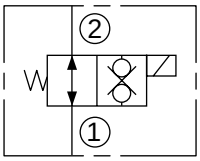
When de-energized, the **SV12-29** allows flow in both directions. When energized, the valve's poppet closes on its seat, blocking flow from ② to ① or ① to ②.

FEATURES

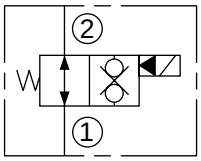
- Continuous-duty rated coil.
- Optional coil voltages and terminations.
- Efficient wet-armature construction.
- Manual Override option.
- Cartridges are voltage interchangeable.
- Optional waterproof E-Coils rated up to IP69K.
- Hardened seat for long life and low leakage.
- Unitized, molded coil design.
- Cost-effective cavity.

SYMBOLS

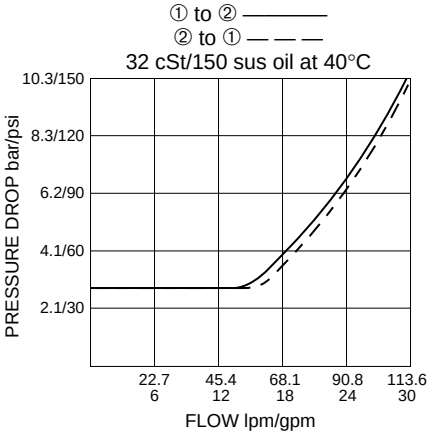
USASI:



ISO:



PERFORMANCE (Cartridge Only)



RATINGS

Operating Pressure: 240 bar (3500 psi)

Flow: 113.6 lpm (30 gpm)

Internal Leakage: 7 drops per minute maximum at 240 bar (3500 psi)

Temperature: -40 to 120°C with standard Buna seals

Coil Duty Rating: Continuous from 85% to 115% of nominal voltage

Response Time: First indication of change of state with 100% voltage supplied at 80% of nominal flow rating: Energized: 60 msec.; De-energized: 15 msec.

Initial Coil Current Draw at 20°C: Standard Coil: 1.67 amps at 12 VDC; 0.18 amps at 115 VAC (full wave rectified).
E-Coil: 1.7 amps at 12 VDC; 0.85 amps at 24 VDC

Minimum Pull-in Voltage: 85% of nominal at 240 bar (3500 psi)

Filtration: See page 9.010.1

Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1

Installation: No restrictions; See page 9.020.1

Cavity: VC12-2; See page 9.112.1

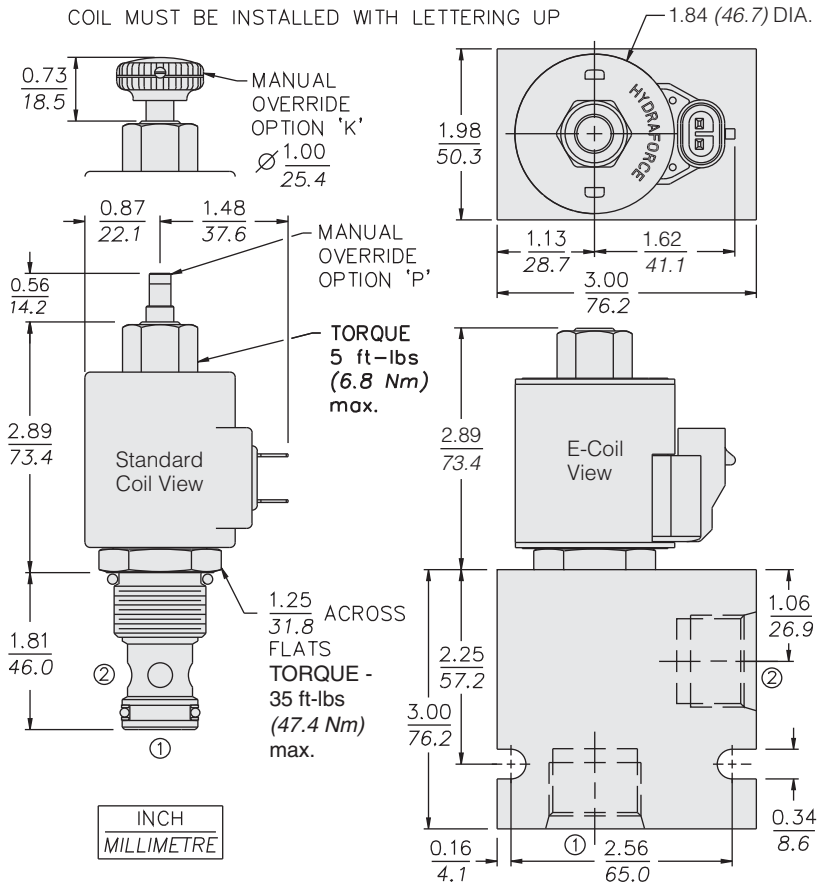
Cavity Tool: CT12-2XX; See page 8.600.1

Seal Kit: SK12-2X-M; See page 8.650.1

Coil Nut: Part No. 7004420

For E-Coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

DIMENSIONS



MATERIALS

Cartridge: Weight: 0.25 kg. (0.55 lbs.) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-up standard.

Standard Ported Body: Weight: 0.57 kg. (1.25 lbs.) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1

Standard Coil: Weight: 0.27 kg. (0.60 lbs.) Unitized thermoplastic encapsulated, Class H high temperature magnetwire. See page 3.200.1

E-Coil: Weight: 0.41 kg. (0.9 lbs.); Fully encapsulated with rugged external metal shell. Rated up to IP69K with integral connectors. **Note: See page 3.400.1 for all E-Coil retrofit applications.**

TO ORDER

SV12-29__ - ____ - __ - _____

Option

None	(Blank)
Manual Override without knob	**P**
Manual Override with knob	**K**

For Manual Override options see page 1.001.1

Porting

Cartridge Only	**0**
SAE 10	**10T**
SAE 12	**12T**
SAE 16	**16T**
3/4 in. BSP*	**6B**
1 in. BSP*	**8B**

*BSP Body; U.K. Mfr. Only

Seals

Buna N (Std.)	**N**
Fluorocarbon	**V**

Voltage
Std. Coil

0	Less Coil**
10	10 VDC†
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
24	24 VAC
115	115 VAC
230	230 VAC

**Includes Std. Coil Nut

† DS, DW or DL terminations only.

E-Coil

10	10 VDC
12	12 VDC
20	20 VDC
24	24 VDC

Termination (VDC)
Std. Coil

DS	Dual Spades
DG	DIN 43650
DL	Leadwires (2)
DL/W	Leads w/Weatherpak® Connectors
DR	Deutsch DT04-2P

Termination (VAC)
Std. Coil

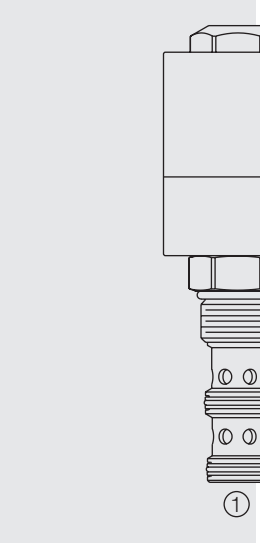
AG	DIN 43650
AP	1/2 in. Conduit

Termination (VDC)
E-Coil

ER	Deutsch DT04-2P (IP69K Rated)
EY	Metri-Pack® 150 (IP69K Rated)

Coils with internal diode are available. Consult factory.

SV12-34 Spool, 3-Way



DESCRIPTION

A solenoid-operated, three-way, direct-acting spool-type, screw-in hydraulic cartridge valve.

OPERATION

When de-energized, the **SV12-34** allows flow between ② and ①, while blocking flow at ③. When energized, the spool shifts to allow flow between ② and ③, while blocking flow at ①.

FEATURES

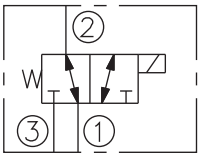
- Continuous-duty rated solenoid.
- Hardened spool and cage for long life.
- Optional coil voltages and terminations.
- All ports may be fully pressurized.
- Heavy-duty waterproof E-Coils rated up to IP69K.

RATINGS

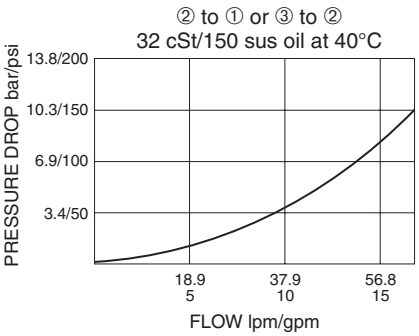
Operating Pressure: 240 bar (3500 psi) max.
Flow: See Performance Chart
Leakage: 410 cc/minute (25 cu. in./minute) at 240 bar (3500 psi)
Temperature: -40 to 120 °C with Buna N seals
Coil Duty Rating: See Chart
Response Time: Pull-In: 100 ms Drop-Out: 100 msec
Initial Coil Current Draw at 20 °C: 2.8 A at 12 Vdc
Filtration: See page 9.010.1
Fluids: Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 sus); See Temperature and Oil Viscosity, page 9.060.1
Installation: No restrictions; See page 9.020.1
Cavity: VC12-3; See page 9.112.1
Cavity Tool: CT12-3XX; See page 8.600.1
Seal Kit: SK12-3X-MM; See page 8.650.1
E-Coil Nut: Part No. 7085180

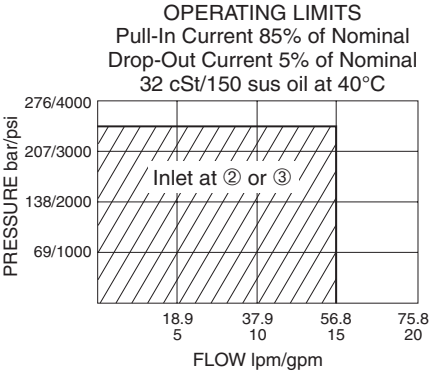
SYMBOLS

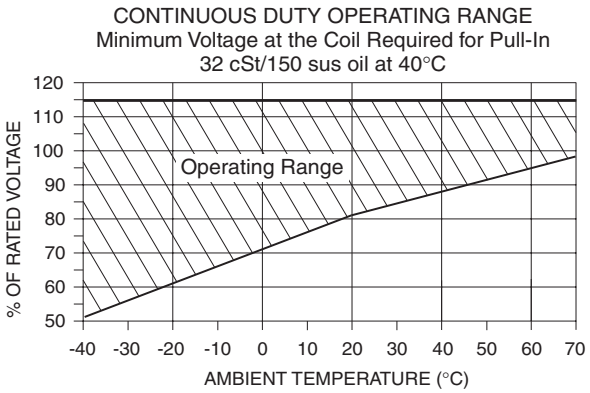
USASI/ISO:



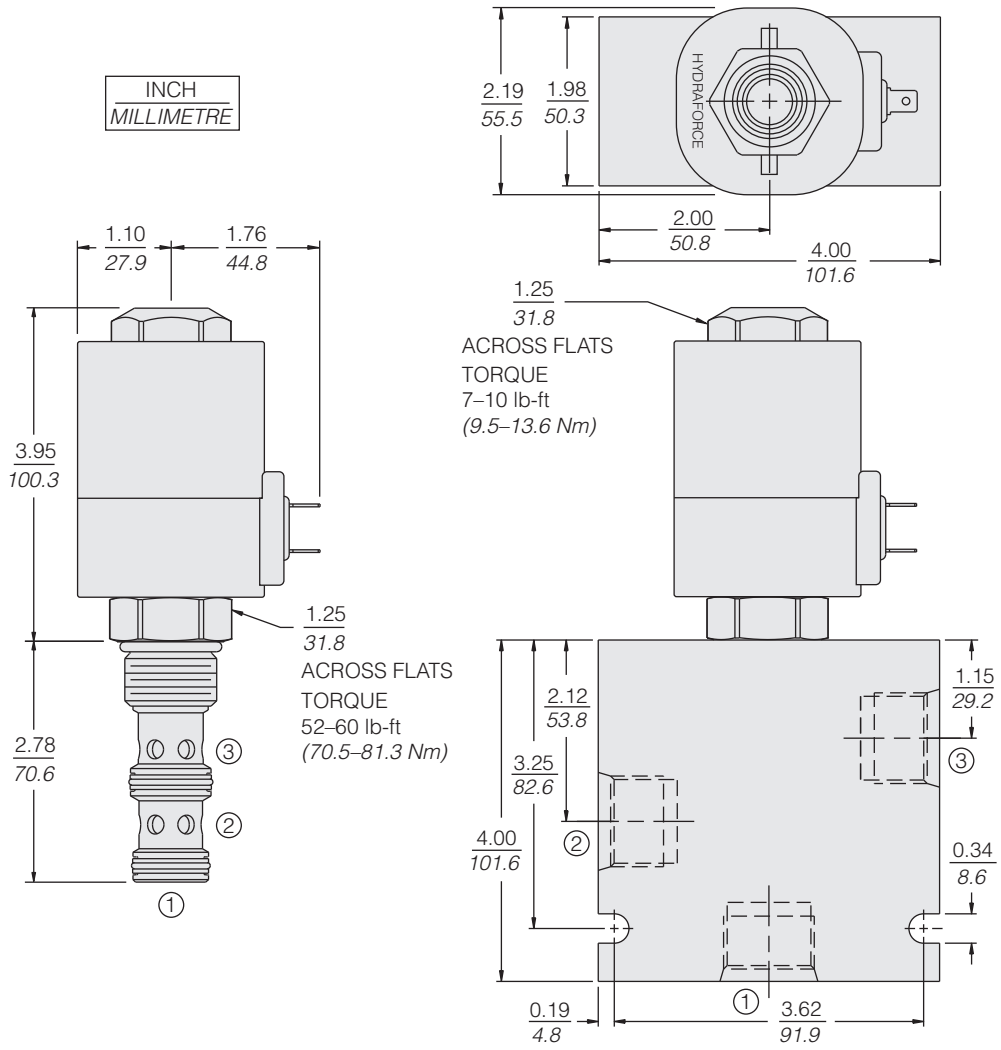
PERFORMANCE (Cartridge Only)







DIMENSIONS



MATERIALS

Cartridge: Weight: 0.29 kg (0.65 lb) Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and TFE back-ups standard.

Standard Ported Body: Weight: 0.98 kg (2.15 lb) Anodized high-strength 6061 T6 aluminum alloy, rated to 207 bar (3000 psi). Ductile iron bodies available; dimensions may differ. See page 8.012.1.

E-Coil: Weight: 1.36 kg (3.0 lb) Fully encapsulated with rugged external metal shell.
Rated up to IP69K with integral connectors. See page 3.400.1.

TO ORDER

SV12-34 __ - __ __ __ - __ - __ __ __ __ __

Option
None (Blank)
Manual Override without Knob **P**
Manual Override with Knob **K**

Porting
Cartridge Only **0**
SAE 8 **8T**
SAE 10 **10T**
SAE 12 **12T**
1/2 in. BSP* **4B**
3/4 in. BSP* **6B**
*BSP Body; U.K. Mfrs. Only

Seals
N Buna N (Std.)
V Fluorocarbon

Voltage
0 Less Coil
12 12 Vdc
24 24 Vdc

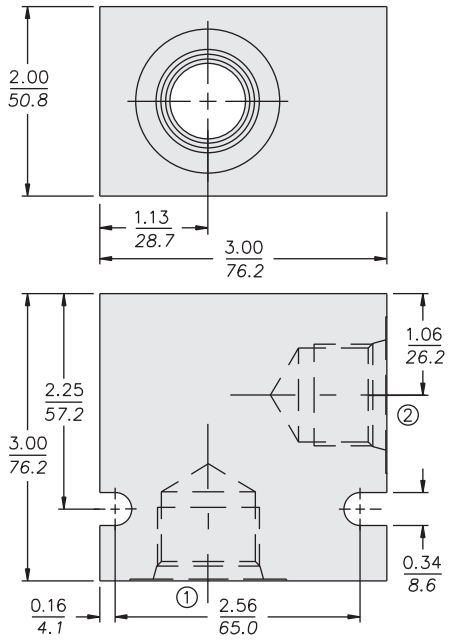
Terminations (Vdc)
EL Leadwires (2), IP65 Rated
ES Dual Spades, IP65 Rated
EG DIN 43650, IP65 Rated
EW Leads w/Weather-Pack® Connector, IP65 Rated
EY Metri-Pack® 150 Connector, IP69K Rated

Coils with internal diode are available. Consult factory.

Other coil voltages may be available for OEM applications. Consult factory.

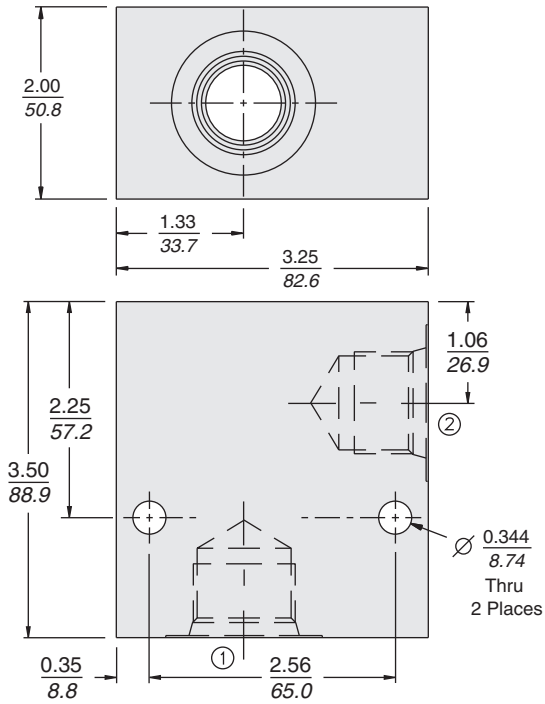
Series 12 Valve Housings

2-WAY
Aluminum



SAE 12 Ported Housing shown

2-WAY
Ductile Iron



SAE 12 Ported Housing shown

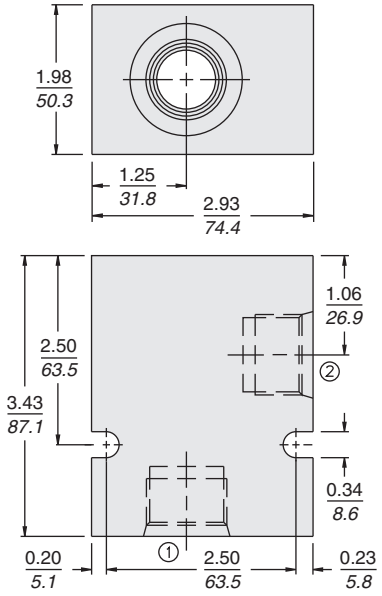
Blue Rectangles are links to CAD .stp files.

SERIES 12 2-WAY HOUSINGS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
10T	7022240	Alum.	SAE 10	SAE 10	U.S.
12T	7022250	Alum.	SAE 12	SAE 12	U.S.
16T	7022260	Alum.	SAE 16	SAE 16	U.S.
6B	7022520	Alum.	3/4" BSP	3/4" BSP	U.K.
8B	7022530	Alum.	1" BSP	1" BSP	U.K.
12TD	7155010	Duct. Iron	SAE 12	SAE 12	U.S.
16TD	7155020	Duct. Iron	SAE 16	SAE 16	U.S.
6BD	7155050	Duct. Iron	3/4" BSP	3/4" BSP	U.K.
8BD	7155060	Duct. Iron	1" BSP	1" BSP	U.K.

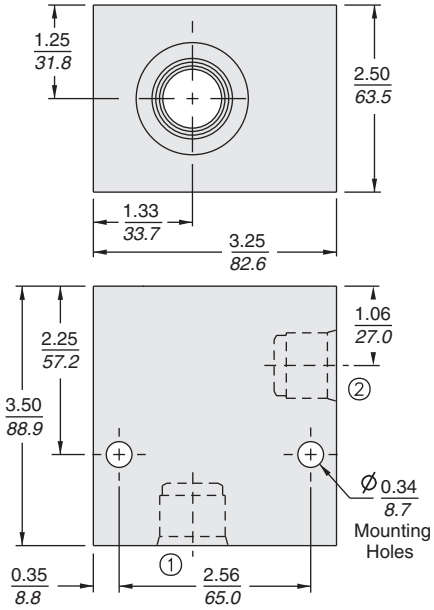
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

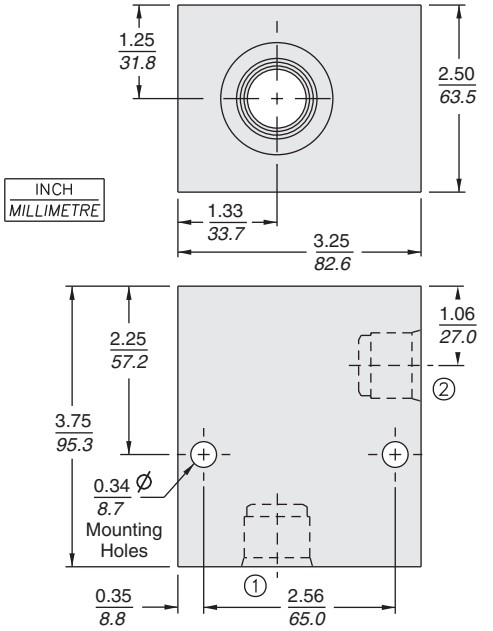
2-WAY 12-L2
Aluminum



2-WAY
Ductile Iron, H-Series



2-WAY
Ductile Iron, H-Series, Variation A



Blue Rectangles are links to CAD .stp files.

SERIES 12 2-WAY 12-L2 HOUSINGS*					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
08T	7020650	Alum.	SAE 08	SAE 08	U.S.
10T	7020660	Alum.	SAE 10	SAE 10	U.S.
12T	7020670	Alum.	SAE 12	SAE 12	U.S.

* Designed for use with PV72-20, PV72-21 and FR12-23 valves.

SERIES 12 2-WAY H-SERIES HOUSINGS					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
16HT	7158420	Duct. Iron	SAE16	SAE16	U.S.
8HB	7158460	Duct. Iron	1" BSP	1" BSP	U.K.

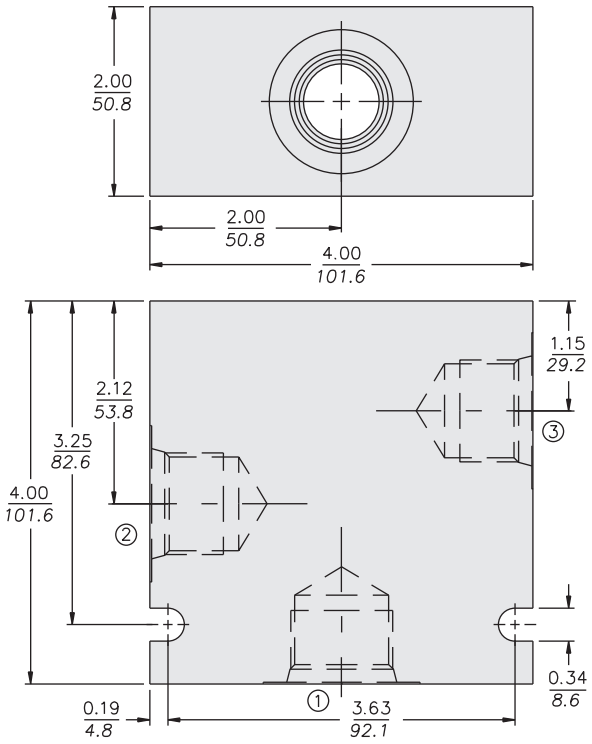
SERIES 12 2-WAY H-SERIES VARIATION A HOUSINGS*					
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Mfg. Loc.**
10HT	7160010	Duct. Iron	SAE10	SAE10	U.S.
12HT	7160020	Duct. Iron	SAE 12	SAE12	U.S.
4HB	7160050	Duct. Iron	1/2" BSP	1/2" BSP	U.K.
6HB	7160060	Duct. Iron	3/4" BSP	3/4" BSP	U.K.

* Designed for use with HPV12-20 and HPV12-21 valves.

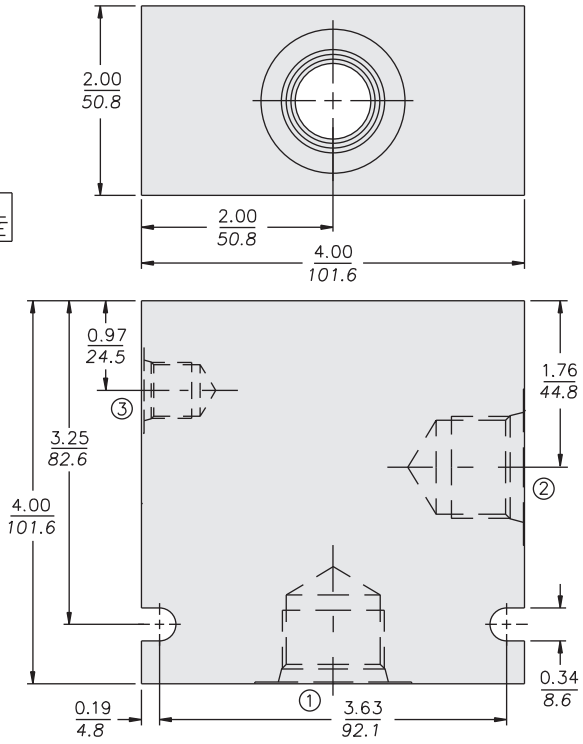
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

3-WAY
Aluminum or Ductile Iron



3-WAY Short
Aluminum or Ductile Iron



SAE 12 Ported Housing shown

Blue Rectangles are links to CAD .stp files.

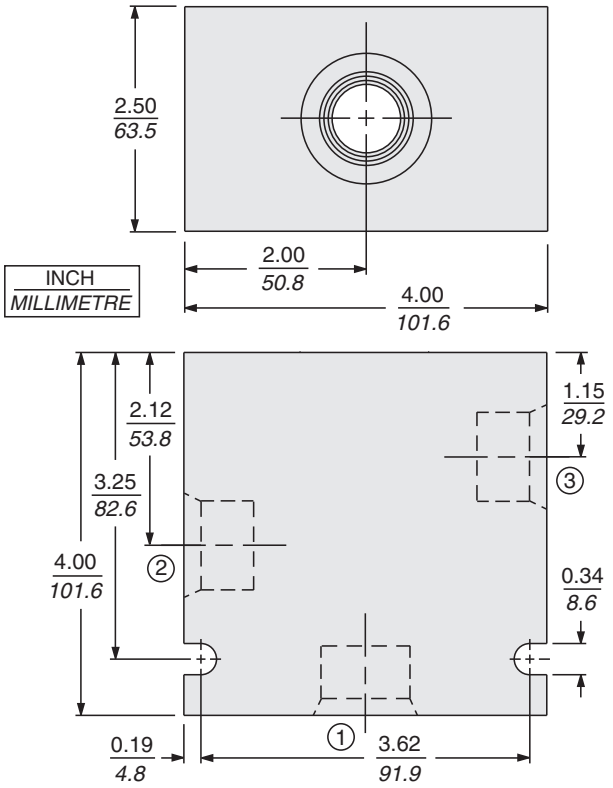
SERIES 12 3-WAY HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
8T	7022320	Alum.	SAE 8	SAE 8	SAE 8	U.S.
10T	7022330	Alum.	SAE 10	SAE 10	SAE 10	U.S.
12T	7022340	Alum.	SAE 12	SAE 12	SAE 12	U.S.
8TD	7155100	Duct. Iron	SAE 8	SAE 8	SAE 8	U.S.
12TD	7155120	Duct. Iron	SAE 12	SAE 12	SAE 12	U.S.
6B	7022620	Alum.	3/4" BSP	3/4" BSP	3/4" BSP	U.K.

SERIES 12 3-WAY SHORT HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
12T	7027400	Alum.	SAE 12	SAE 12	SAE 6	U.S.
12TD	7150620	Duct. Iron	SAE 12	SAE 12	SAE 6	U.S.
6BD	7150660	Duct. Iron	3/4" BSP	3/4" BSP	3/8" BSP	U.K.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

3-WAY
Ductile Iron, H-Series

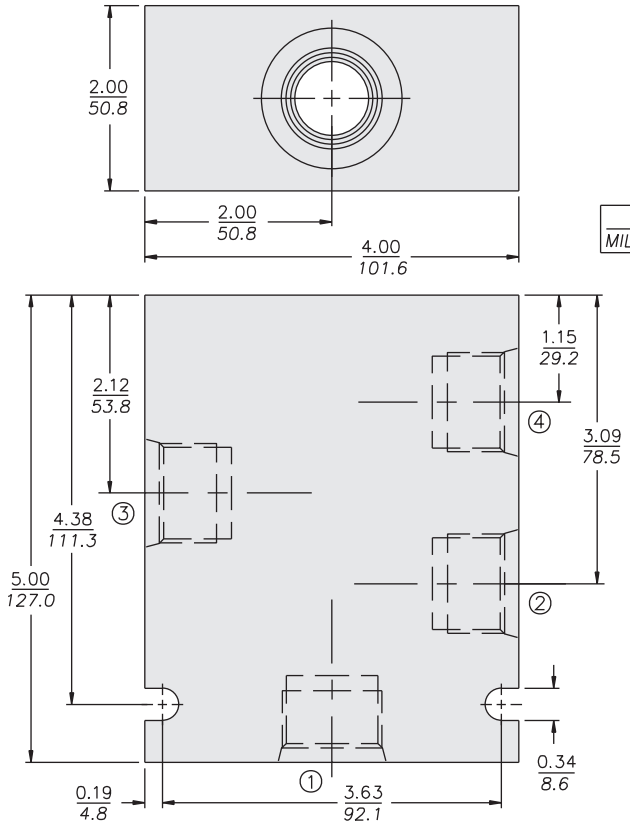


SERIES 12 3-WAY H-SERIES HOUSINGS						
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Mfg. Loc.**
8HT	7158500	Duct. Iron	SAE 8	SAE 8	SAE 8	U.S.
10HT	7158510	Duct. Iron	SAE 10	SAE 10	SAE 10	U.S.
12HT	7158520	Duct. Iron	SAE 12	SAE 12	SAE 12	U.S.
4HB	7158550	Duct. Iron	1/2" BSP	1/2" BSP	1/2" BSP	U.K.
6HB	7158560	Duct. Iron	3/4" BSP	3/4" BSP	3/4" BSP	U.K.

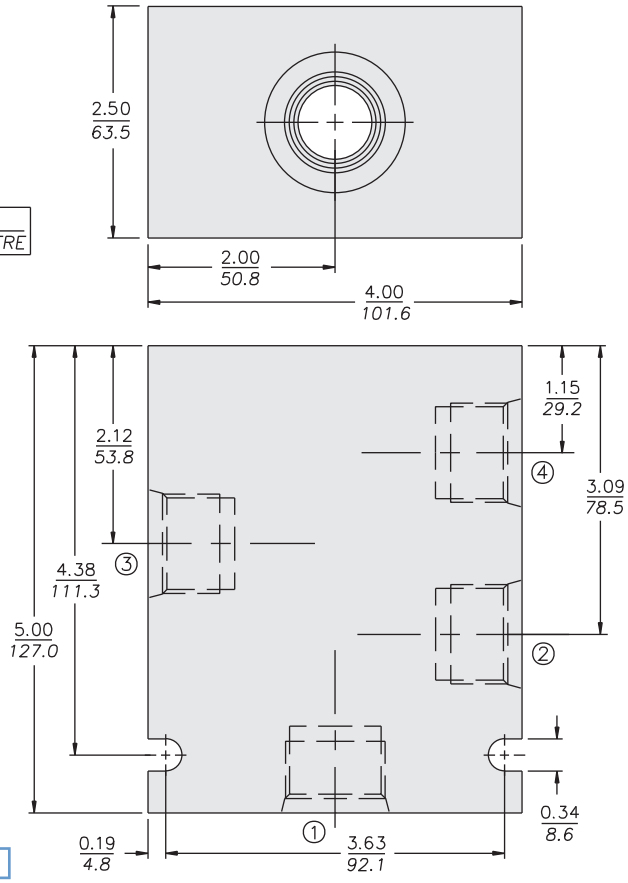
HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

4-WAY
Aluminum or Ductile Iron



4-WAY
Ductile Iron, H-Series



Blue Rectangles are links to CAD .stp files.

SERIES 12 4-WAY HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
10T 12T	7022480 7022470	Alum. Alum.	SAE 10 SAE 12	SAE 10 SAE 12	SAE 10 SAE 12	SAE 10 SAE 12	U.S. U.S.
10T* 12T*	7022460 7022440	Alum. Alum.	SAE 6 SAE 6	SAE 10 SAE 12	SAE 10 SAE 12	SAE 10 SAE 12	U.S. U.S.
8TD 12 TD	7150700 7150720	Duct. Iron Duct. Iron	SAE 8 SAE 12	SAE 8 SAE 12	SAE 8 SAE 12	SAE 8 SAE 12	U.S. U.S.
6B 6BD	7022720 7150760	Alum. Duct. Iron	3/4" BSP 3/4" BSP	3/4" BSP 3/4" BSP	3/4" BSP 3/4" BSP	3/4" BSP 3/4" BSP	U.K. U.K.

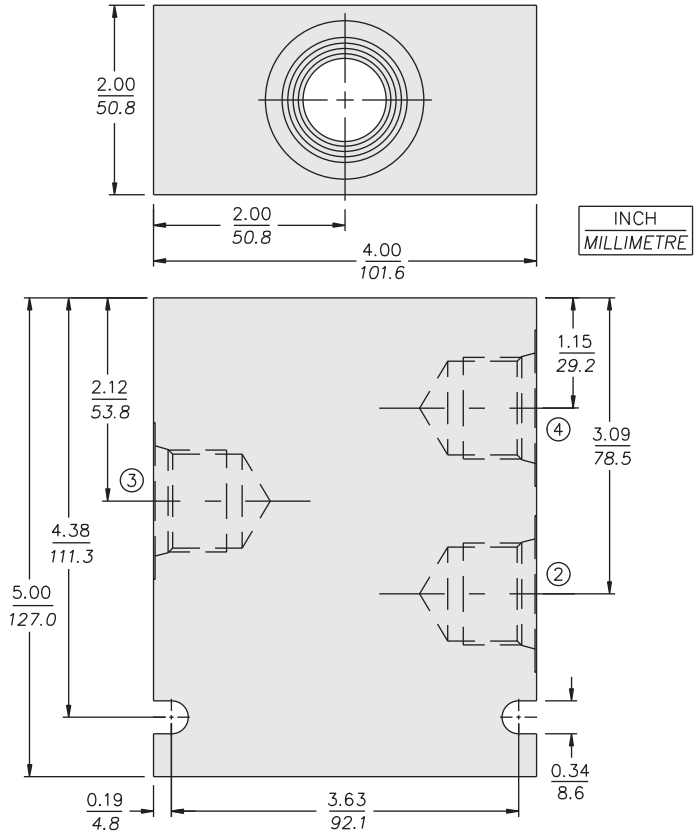
*PD-TYPE BODY

SERIES 12 4-WAY H-SERIES HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
12HT	7158620	Duct. Iron	SAE 12	SAE 12	SAE 12	SAE 12	U.S.
6HB	7158660	Duct. Iron	3/4" BSP	3/4" BSP	3/4" BSP	3/4" BSP	U.K.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

4-WAY 3-PORT
Special FD-Type, Aluminum or Ductile Iron



SAE 12 Ported Housing shown

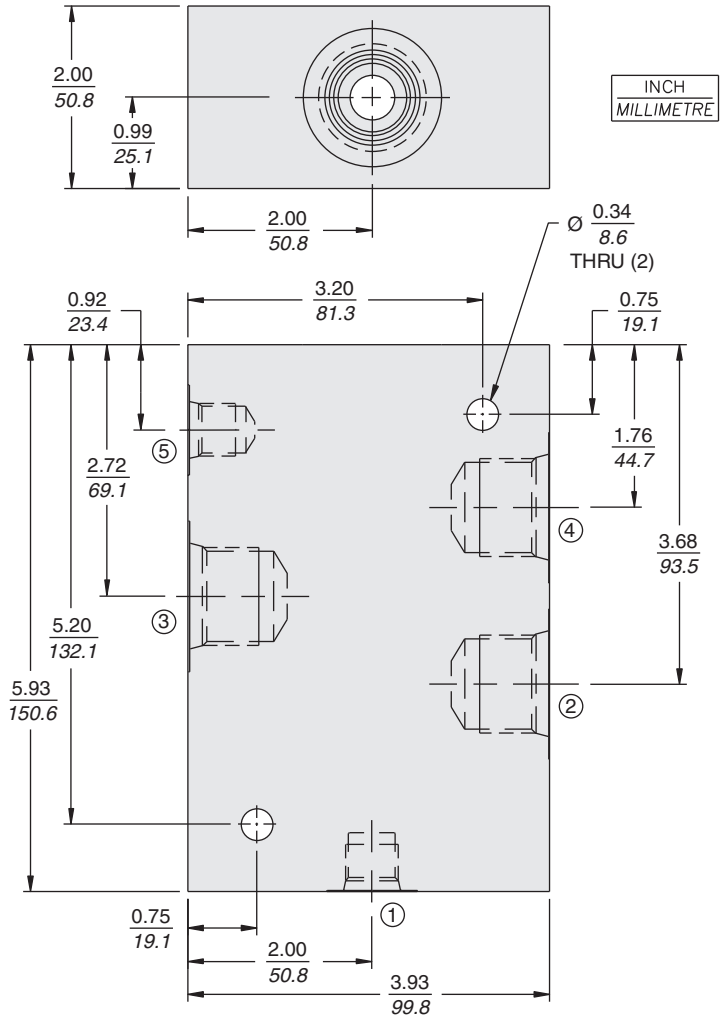
Blue Rectangles are links to CAD .stp files.

SERIES 12 4-WAY 3-PORT SPECIAL FD-TYPE HOUSINGS							
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Mfg. Loc.**
10T	7022450	Alum.	—	SAE 10	SAE 10	SAE 10	U.S.
12T	7022430	Alum.	—	SAE 12	SAE 12	SAE 12	U.S.
12TD	7150820	Duct. Iron	—	SAE 12	SAE 12	SAE 12	U.S.
6BD	7150860	Duct. Iron	—	3/4" BSP	3/4" BSP	3/4" BSP	U.K.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

5-WAY
PD-Type, Aluminum



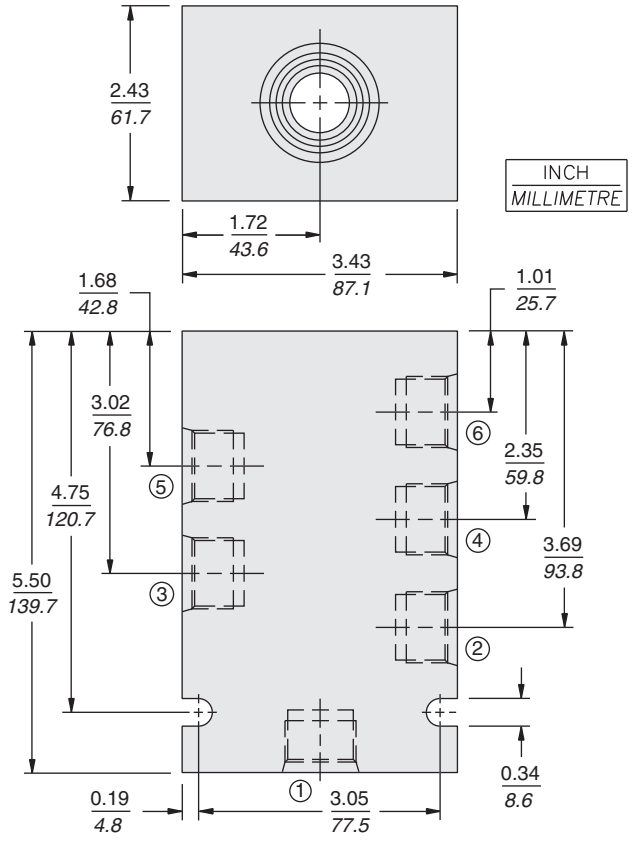
Blue Rectangles are links to CAD .stp files.

SERIES 12 5-WAY PD-TYPE HOUSINGS								
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Port 5**	**Mfg. Loc.**
10T	7029900	Alum.	SAE 6	SAE 10	SAE 10	SAE 10	SAE 6	U.S.
12T	7029910	Alum.	SAE 6	SAE 12	SAE 12	SAE 12	SAE 6	U.S.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

6-WAY
Aluminum



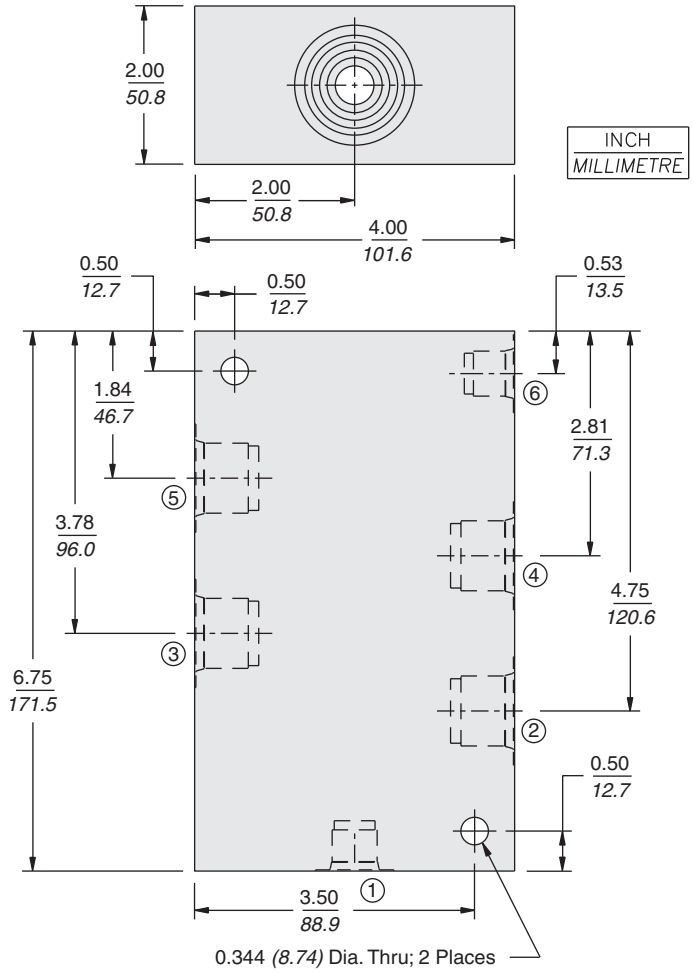
Blue Rectangles are links to CAD .stp files.

SERIES 12 6-WAY HOUSINGS									
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Port 5**	**Port 6**	**Mfg. Loc.**
8T	7021470	Alum.	SAE 8	SAE 8	SAE 8	SAE 8	SAE 8	SAE 8	U.S.
10T	7021480	Alum.	SAE 10	SAE10	SAE 10	SAE 10	SAE 10	SAE10	U.S.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Series 12 Valve Housings

6-WAY, 12-S6 Test Housing
PD/PE-Type, Ductile Iron



SERIES 12 6-WAY 12-S6 PD/PE-TYPE TEST HOUSING									
Code	**Part No.**	**Material**	**Port 1**	**Port 2**	**Port 3**	**Port 4**	**Port 5**	**Port 6**	**Mfg. Loc.**
10TD	7150250	Duct. Iron	SAE 6	SAE 10	SAE 10	SAE 10	SAE 10	SAE 6	U.S.

HYDRAFORCE STANDARD VALVE HOUSINGS			
MATERIAL	**OPERATING PRESSURE**	**PORTS**	**MFG. LOCATION**
Aluminum	210 bar (3000 psi)	SAE	U.S.
Aluminum	210 bar (3000 psi)	BSP	U.K.
Ductile Iron	350 bar (5000 psi)	SAE	U.S.
Ductile Iron	350 bar (5000 psi)	BSP	U.K.

Blue rectangles are links to other catalog pages.

Series E Environmental Coils

NEW SERIES E WATER-PROOF / WEATHER-RESISTANT SOLENOID VALVE COILS

New Series E coils are the latest innovation in coil technology from Hydraforce. They are designed to meet the demanding requirements of mobile and industrial applications where weather resistance is required. Models with Deutsch DT and Metri-Pack® integral connectors and new dual leadwire models meet or exceed all IP69K standards for weather resistance, offering superior reliability under the most demanding conditions. Series E coils have passed what is known in the construction, agricultural and mobile equipment markets as the "Thermal Shock Dunk Test."

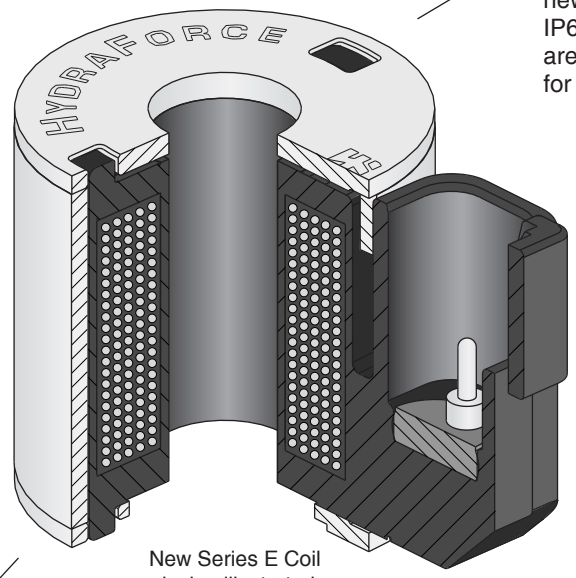
Series E coils feature a new, fully encapsulated coil winding technology. Deutsch and Metri-Pack® connectors are molded into the coil encapsulation, assuring IP69K weather resistance. An external metal shell serves as the element to concentrate the magnetic flux for the coil winding and also functions as a rugged container for the coil. No O-rings or waterproofing kits are required.

Models are available to fit most HydraForce valves. In most applications, these coils can be used to retrofit HydraForce valves already in field operation and will offer superior weather resistance.

Easy Installation
No O-rings, external sealing, or waterproofing kits required.

Thermal Shock Dunk Test Rated
Series E coils with leadwires, Deutsch DT and Metri-Pack® connectors have passed what is known in the construction, agricultural and mobile equipment markets as the "Thermal Shock Dunk Test." (See page 3.400.2 for a description of this test.)

IP69K Rated with Integral Connectors and with New Dual Leadwires
Models with Deutsch DT and Metri-Pack® connectors as well as the new dual leadwire models are rated for IP69K. DIN and dual spade connections are rated for IP65. (See page 3.400.2 for a description of ratings.)



New Series E Coil design illustrated

Field Retrofit-able
In most cases, Series E coils can be used to replace existing coils on HydraForce valves already in operation.

Fully Encapsulated Windings
Coils are fully encapsulated for zero leak paths when ordered with integral connector options.

Shock Resistant
Integral grommet for Deutsch DT connectors increases durability under conditions of high random shock.

Rugged Metal Shell
The rugged external metal shell provides exceptional protection against physical damage, ensuring durability under harsh operating conditions. It is salt spray rated for 1000 hours per ASTM B117 specifications.

High Temperature Operation
Class N 200°C (392°F) rated magnet wire and insulation materials allow high temperature operation and ensure long life under demanding conditions. Continuous-duty operation up to 100°C and 115% of nominal voltage.

NOTE: Some coils, including those manufactured prior to 1-1-04, may differ slightly in construction from this illustration. See page 3.400.17

IMPROVING DURABILITY TO ASSURE LONG LIFE IN THE HARSHEST ENVIRONMENTS

HydraForce has made design changes to the industry-leading environmentally-hardened Series E coils. The new design provides longer life under high-temperature conditions, as well as easier and more convenient interchange with our Series D standard-duty coils.

The Story Behind the Ratings

To appreciate the performance of the new Series E coils, it is helpful to have a working knowledge of the testing conducted to assure coil life in the harshest environments. Many OEMs request a coil that is IP67 or IP69 rated. These ratings do not address the issue of the effect of high temperatures on coil life and operation. Therefore they are of limited value in evaluating the suitability of a coil for use in typical mobile equipment applications.

Why temperature matters: When a coil is heated, the air inside the coil expands, creating internal pressure, causing the heated air to attempt to exit the coil. If the coil is then submerged in cold water, the air within the coil cools and contracts, drawing water into the coil through any seams or voids in the coil encapsulant. Eventually the water will find its way into the winding area, causing the coil winding to corrode or short-circuit, resulting in coil failure.

IP ratings are international specifications for electrical equipment which define various levels of protection against failure resulting from contamination by water or other foreign substances. The IP67 rating is based on submerging the coil in one meter of water for 30 minutes. The coil is then inspected for evidence of water infiltration. The IP67 specification loosely states that “ingress of water in quantities causing harmful effect shall not occur.” The exact meaning of the phrase “harmful effect” is not precisely defined, and is therefore open to some interpretation. In this test, the coil is not subjected to high temperatures, so the effects of thermal stress are not considered.

The IP69 rating, which is currently only part of the DIN version of this specification, first requires that the coil pass the test for IP67 as described above. Beyond that, the coil and its integral electrical connector are subjected to a rigorous high-pressure water spray. The water is mixed with detergent, is held at a temperature of 80°C., and is sprayed at the coil from a distance of 100 mm (4 inches) at a pressure of 100 bar (1450 psi). Again, the specification does not precisely define the amount of water ingress that would be considered unacceptable.

HydraForce Ratings

Working with major mobile equipment OEMs, HydraForce has developed even more rigorous tests that are designed to assure that our coils will perform reliably under the harshest real-world application conditions. Both our original and our new Series E coils meet or exceed the requirements of what is known as the “Thermal Shock Dunk Test.” In this test the coil is thermally “soaked” for two hours in an ambient temperature of 100°C. The coil is then immersed immediately in a 0°C salt-water bath for two hours. This procedure is repeated ten times. The coil is then inspected for water ingress. By Hydraforce’s standards, the coil is considered to have passed this test if there is NO detectable water ingress, as determined by visual inspection and a “high pot” test. This standard requires a totally sealed coil that is impervious to moisture infiltration, even under widely varying ambient thermal conditions.

The new Series E coils can now withstand at least 10 cycles of the “Thermal Shock Dunk Test.”

In addition to the requirements of the industry-recognized, “Thermal Shock Dunk Test,” described above, HydraForce further tests these coils for durability against failure due to vibration, as well as against failure due to the application of voltage above the coil’s standard duty rating while it is simultaneously subjected to continually varying ambient temperatures.

Beyond enhancing the durability of the coils, we have decreased the wattage by approximately 10%. This reduces the power consumption and also allows the operating temperature range to be extended. The new design also improves the ease and convenience of interchanging these coils with HydraForce’s Series D (standard duty) coils, the original Series E coils, as well as the older “W-style” waterproof option. The new Series E coils use the same retaining nuts as the Series D coils, simplifying interchangeability, inventory and assembly requirements and procedures.

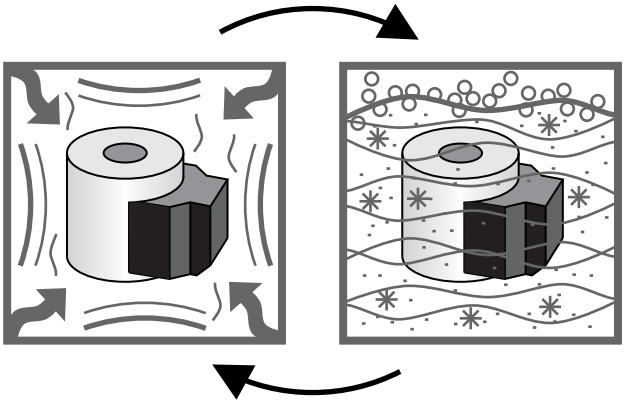
See page 3.400.17 for detailed information describing the differences between the original Series E coils and the new Series E coils, including part number cross-references for the coils, the retaining nuts, and the spacers used on the dual-solenoid valves.

Series E Environmental Coils

OUR COIL TESTING PROGRAM IS THE MOST STRINGENT AND RIGOROUS IN THE INDUSTRY

1.) Extended Thermal Shock Immersion Test – IP67

Ref. Exceeds IP67 per standard EN60529

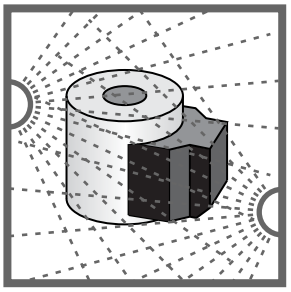


The purpose of this test is to try to induce cracks in the encapsulation of the coil.

The coil is heated for two hours at an ambient temperature of 105°C (±5°C), then immediately immersed in a solution of water, detergent and salt at a temperature of 0° to 5°C for two hours. The coils is then visually inspected for cracks and water penetration. This process is repeated ten times.

2.) Salt Spray Test DIN 50 021 Level 1

(Ref: Standard ASTM B117)

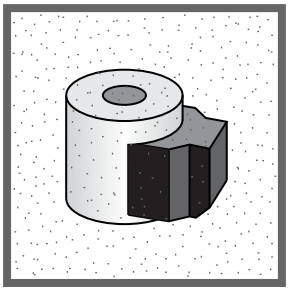


This accelerated test is designed to simulate the corrosive environment that the coil will encounter during the life of the vehicle.

The coil is subjected to a continuous salt spray as per ASTN B117 for a period of 20 hours. The coil is then rinsed and dried.

3.) Inorganic Dust Test

ANSI/ASAE EP455 Section 5.3



This tests for the effects of dust on the coil.

The coil is placed in a dust chamber containing the equivalent of air cleaner fine dust. Sufficient air movement is provided to maintain a minimum 0.88g per cubic meter with the coil positioned in its normal mounting position. The test is run for a minimum of 24 hours.

4.) Vibration Test

This accelerated test simulates random vibration that the coil will encounter when used on heavy-duty equipment.

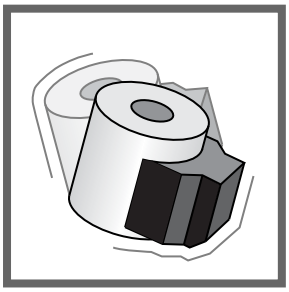
Functional performance is monitored under the following vibration levels shown in the table below for 72 hours in each of the three perpendicular axes. The coil is then checked for impaired function, loose parts and fatigue cracks induced by the test.

Vibration Test Profile:

Frequenc y (Hz)	Measured PSD (G^2/Hz)	Acceleration Factor	Accelerated Test PSD (G^2/Hz)
20	0.422	x 2	0.844
25	0.781	x 2	1.562
76	0.174	x 2	0.348
137	0.00283	x 7.2	0.020374
216	0.00073	x 7.2	0.005256
261	0.00119	x 7.2	0.008568
320	0.00042	x 7.2	0.003024
399	0.0000415	x 7.2	0.000298
626	0.0000265	x 7.2	0.0001908
712	0.000452	x 7.2	0.0032544
799	0.0000491	x 7.2	0.00035352
966	0.00117	x 7.2	0.008424
1424	0.00000965	x 7.2	0.00006948
1597	0.00012	x 7.2	0.000864
1996	0.0000154	x 7.2	0.0001108

COIL TESTING PROGRAM (cont'd)

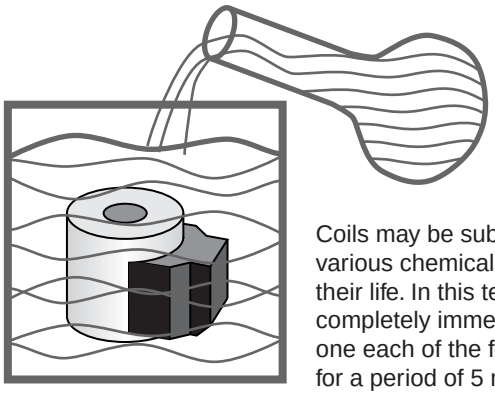
5.) Operating Shock



This test simulates sudden, severe shock induced when the vehicle is driven over rough terrain.

The coil must withstand a 5 ms pulse of 490 m/sec^2 (50 g). Impaired function, loose parts, and fatigue cracks caused by this test result in part rejection. The test is repeated a total of five times in each of the three perpendicular axes.

6.) Chemical Resistance



Coils may be subjected to various chemicals throughout their life. In this test a coil is completely immersed in only one each of the following fluids for a period of 5 minutes. Twelve coils are used at a time. After immersion the coils are heated for four hours at 50°C and the cycle is repeated for a total of ten trials. Impaired function as a result of this test is cause for failure.

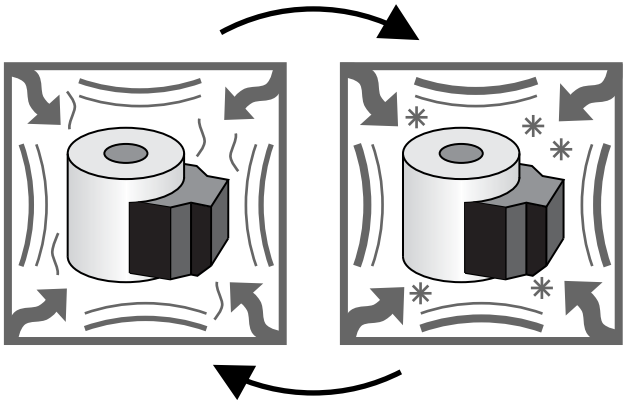
- Gasoline
- Engine Oil
- Hydraulic Fluid
- Bearing Grease
- Antifreeze
- Fertilizer (28% Nitrogen with ammonium nitrate and urea at a pH of 5)
- Diesel Fuel
- Phosphate Wash
- Degreaser
- Windshield Washer Fluid
- Battery Acid

7.) Bench Handling Shock

This test simulates the effects of dropping a coil while it is being handled.

The coil is dropped from a distance of 450mm (±5mm) onto a solid oak bench top at least 44mm thick. The test is repeated by dropping the coil once on all practical edges and faces. Impaired function as a result of this test is cause for rejection.

8.) Storage Temperature



This test simulates the effects of storage in extreme temperatures for some time.

While not in operation, the coil is subjected to +105°C and then –55°C for 20 hours each. Impaired function as a result of this test is cause for rejection.

9.) Humidity

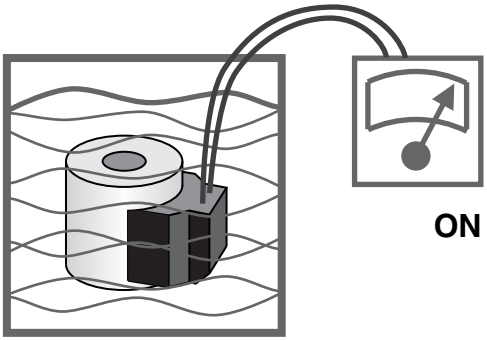
This test simulates the effects of relative humidity on the coil.

The coil is soaked at 40°C and 95% relative humidity for 168 hours each while the coil is not in operation. Impaired function as a result of this test is cause for rejection.

Series E Environmental Coils

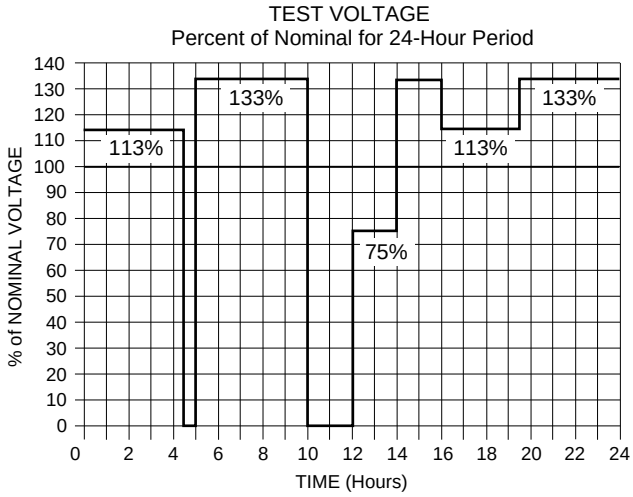
COIL TESTING PROGRAM (cont'd)

10.) Continuous Immersion – IP68
Ref. Standard EN60529

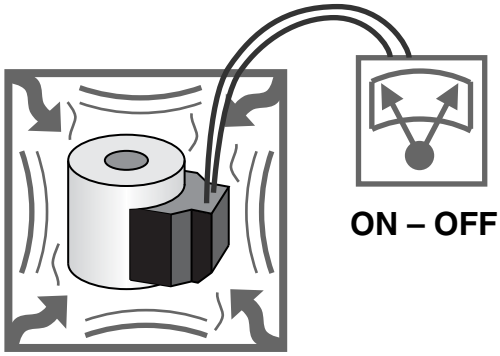


In this test the coil is immersed while powered on.

The coil is immersed in 1 meter of water at an ambient temperature of 25°C (±5°C) for 120 hours while powered according to the chart below. Impaired function as a result of this test is cause for rejection.



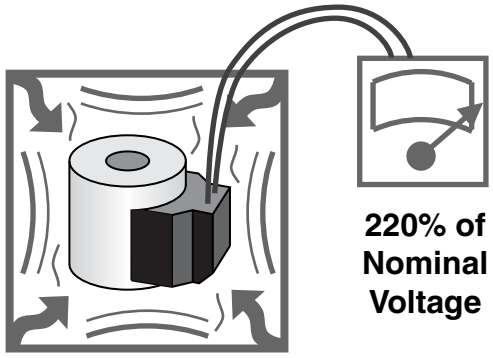
11.) Maximum Load Cycling



This accelerated test simulates temperature cycling to induce cracks or separation between components of the coil.

Coils are installed in an environmental chamber set to 85°C and 133% of nominal voltage is applied for 1 hour. After 1 hour, the power is immediately switched off and back on within 2 seconds. 133% of nominal voltage is then applied for a period of 5 minutes. After 5 minutes, power is immediately switched off and then back on within 2 seconds. This 5-minute cycle is repeated for a total of 168 hours (power is turned off and on within 2 minutes every 5 minutes). Cracks in the encapsulation, separation in components, or impaired function are cause for rejection.

12.) Jump Start

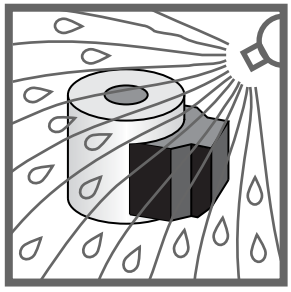


This test simulates the voltage required to jump start heavy equipment.

The coil is thermally soaked in an environmental chamber at 70°C for 2 hours. It is then subjected to 220% of nominal voltage for 5 minutes.

COIL TESTING PROGRAM (cont'd)

13.) High Pressure Cleaning – IP69K
Ref. Standard DIN 40 050, part 9



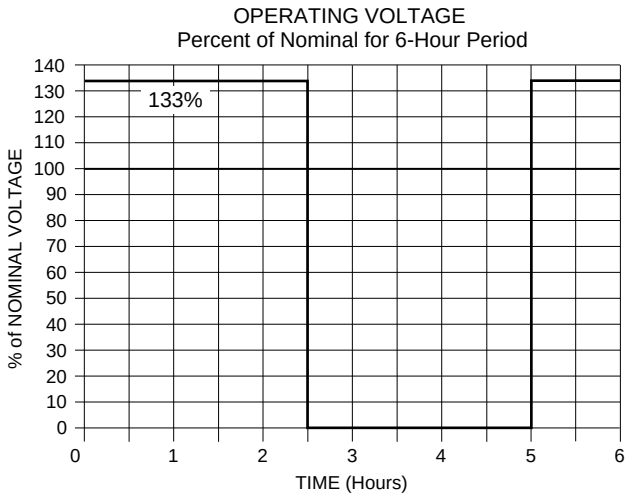
This test simulates high-pressure steam-jet cleaning of a component.

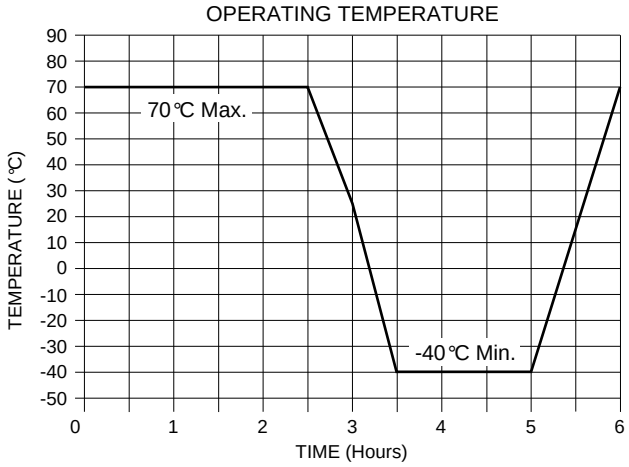
14.) Combined Operating Voltage, Humidity and Temperature

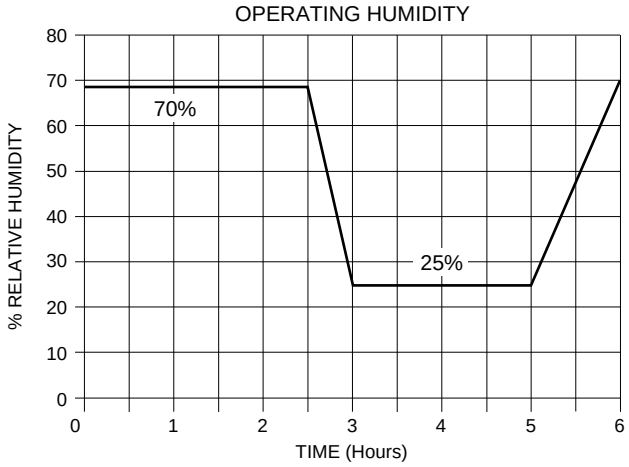
This test simulates the combined effects of some of the previous tests.

The coil is simultaneously subjected to the voltage, temperature and humidity profiles shown in the graphs below. The cycle is repeated for a total of 600 hours (25 days). The coils are inspected every 20 cycles for cracks in the encapsulation, separation of components, or impaired function as a result of this test. Any induced flaws will result in rejection.

14.) Combined Operating Voltage, Humidity and Temperature (continued)



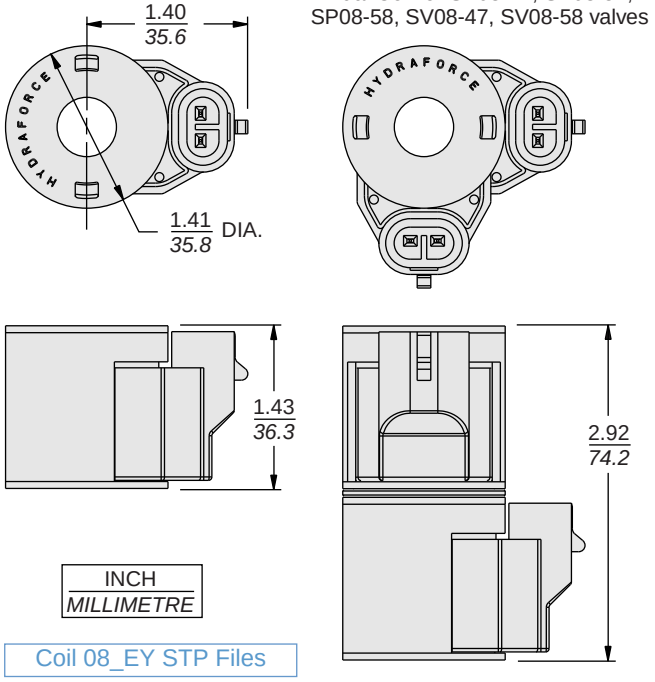




Blue rectangles are links to other catalog pages or files.

Series E Environmental Coils

08-SIZE SERIES E COILS (also for use on 98-size screw-in spool-type valves)



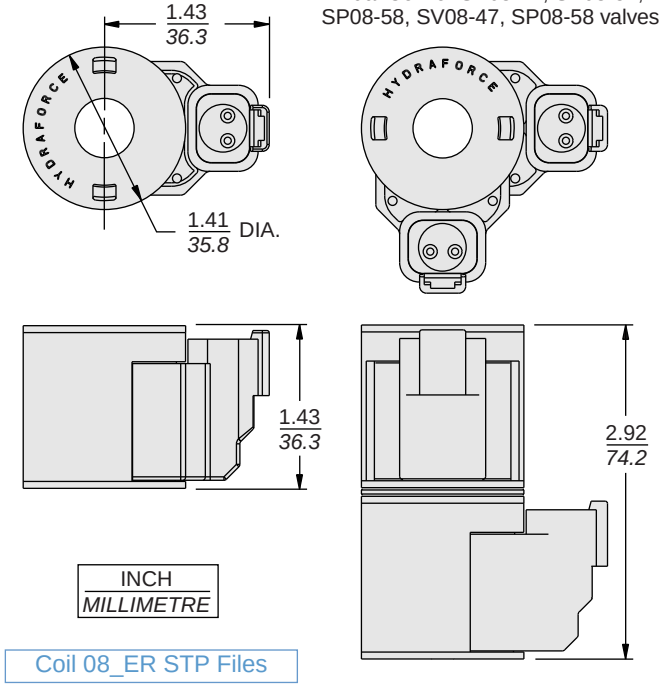
Dual Coil for SP08-47, SP08-57, SP08-58, SV08-47, SV08-58 valves

Coil 08_EY STP Files

EY

IP69K Rated 08-Size Coil
Thermal Shock Dunk Test Rated Coil
Metri-Pack® 150 Connector

Mating Connector: Delphi Packard No. 12052641; HF Part No. 6110119



Dual Coil for SP08-47, SP08-57, SP08-58, SV08-47, SV08-58 valves

Coil 08_ER STP Files

ER

IP69K Rated 08-Size Coil
Thermal Shock Dunk Test Rated Coil
Deutsch DT04-2P Connector

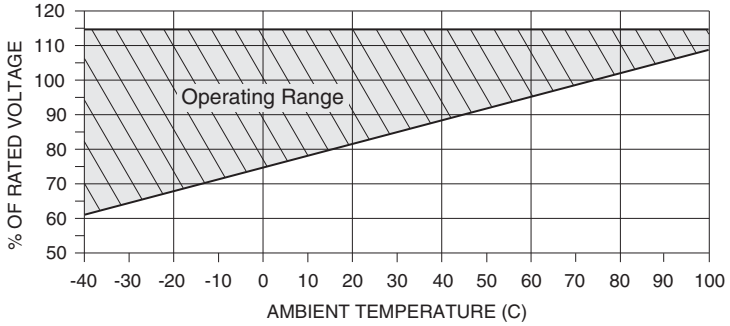
Mating Connector: Deutsch No. DT06-2S — HF Part No. 4001417

EY Coil Part No.	EY/Z* Coil Part No.	ER Coil Part No.	ER/Z* Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4303410	4303810	4303610	4304010	10 VDC	6.2 ohms	1.6 amps	15.9 watts	136 g. (4.8 oz.)
4303412	4303812	4303612	4304012	12 VDC	8.8 ohms	1.4 amps	17.2 watts	136 g. (4.8 oz.)
4303420	—	4303620	4304020	20 VDC	23.9 ohms	0.8 amps	15.3 watts	136 g. (4.8 oz.)
4303424	4303824	4303624	4304024	24 VDC	33.8 ohms	0.7 amps	16.6 watts	136 g. (4.8 oz.)

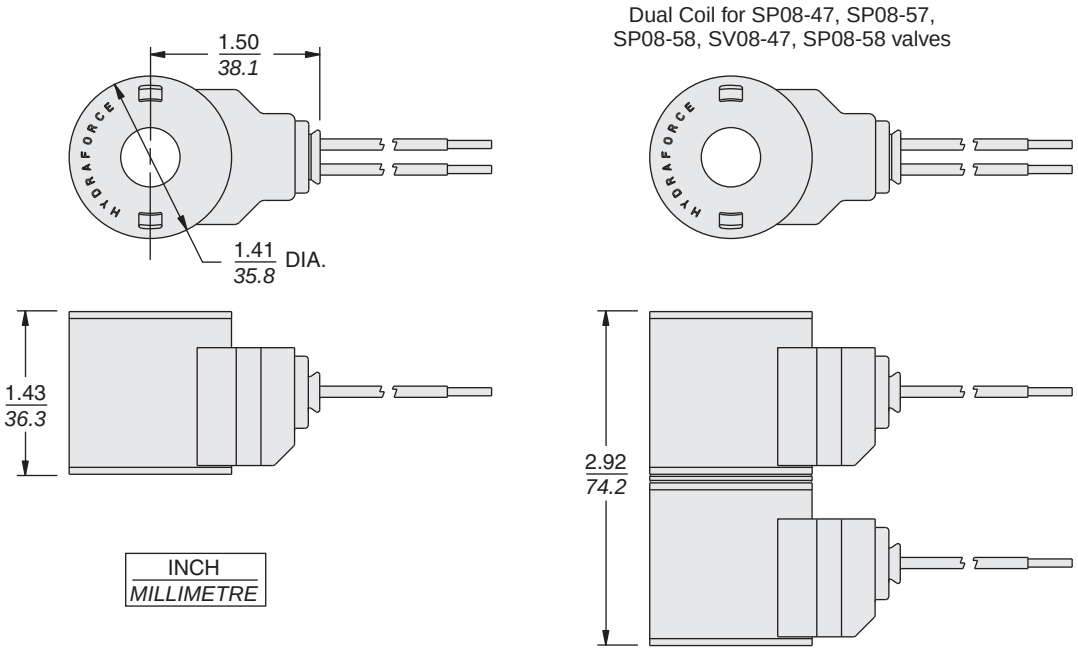
* Models with Zener Diode

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)

CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage Required for Pull-In; 32 cSt/150 sus oil at 40°C



08-SIZE SERIES E COILS (also for use on 98-size screw-in spool-type valves)



EL

IP69K Rated 08-Size Coil
Thermal Shock Dunk Test Rated Coil

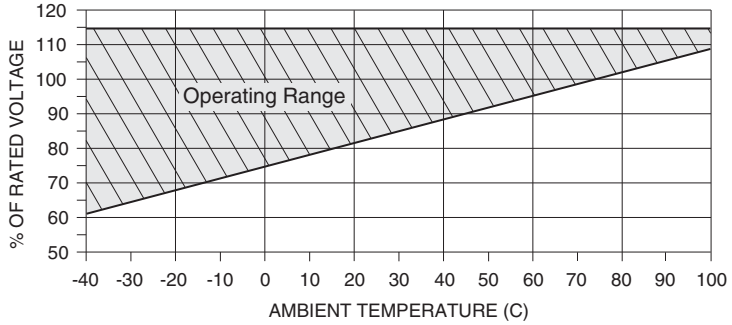
Coil 08_EL STP Files

EL Coil 36" Wire Part No.	EL Coil 18" Wire Part No.	EL/Z* Coil 18" Wire Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4308710	4305110	—	10 VDC	6.2 ohms	1.6 amps	15.9 watts	136 g. (4.8 oz.)
4308712	4305112	4306812	12 VDC	8.8 ohms	1.4 amps	17.2 watts	136 g. (4.8 oz.)
—	4305120	—	20 VDC	23.9 ohms	0.8 amps	15.3 watts	136 g. (4.8 oz.)
4308724	4305124	4306824	24 VDC	33.8 ohms	0.7 amps	16.6 watts	136 g. (4.8 oz.)

* Models with Zener Diode

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)

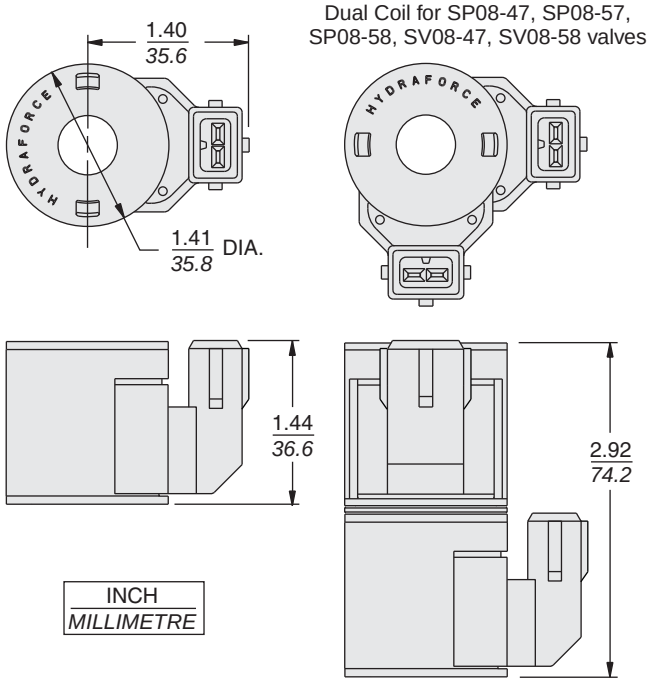
CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage Required for Pull-In; 32 cSt/150 sus oil at 40°C



Blue rectangles are links to other catalog pages or files.

Series E Environmental Coils

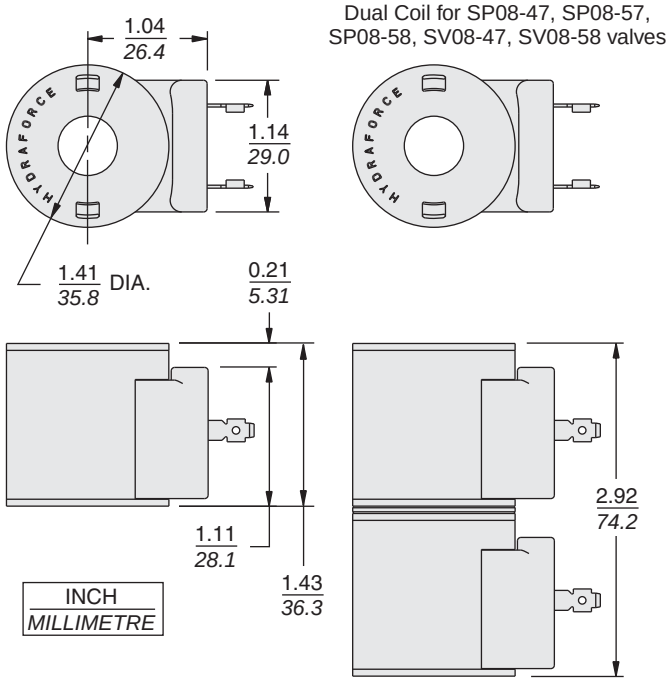
08-SIZE SERIES E COILS (also for use on 98-size screw-in spool-type valves)



EJ

IP67 Rated 08-Size Coil
Amp Jr. Timer Connector

Coil 08_EJ STP Files



EG

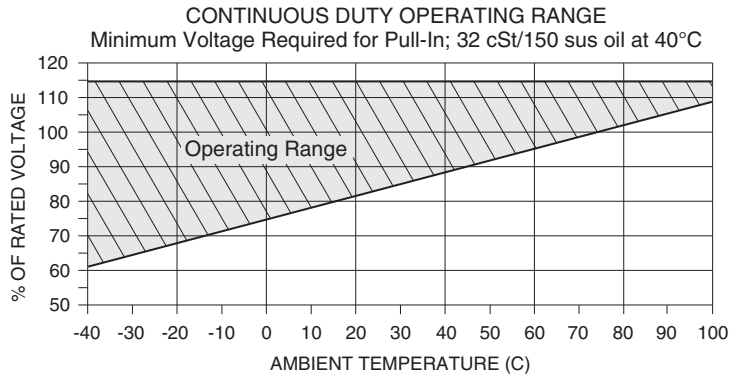
IP65 Rated 08-Size Coil; DIN 43650 Connector
IP67 rated if used with sealed mating connector and gasket

Coil 08_EG STP Files

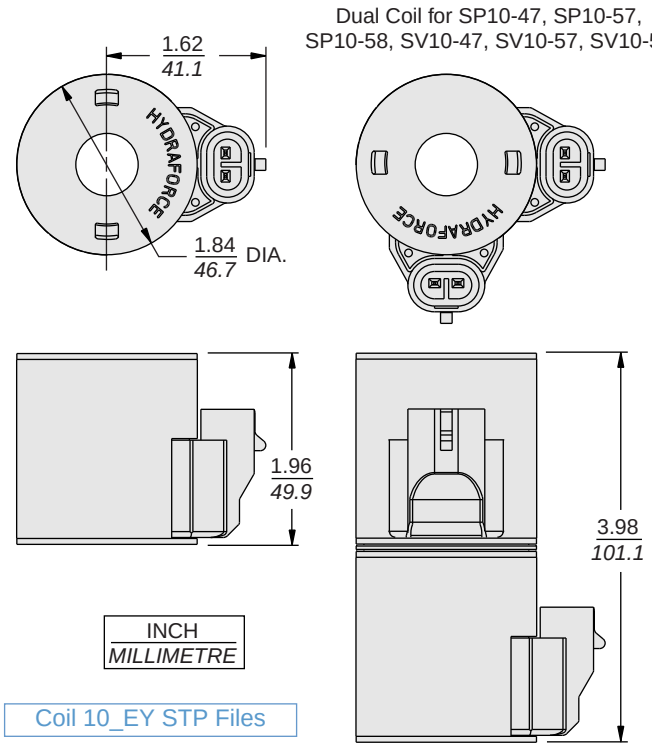
EJ Coil Part No.	EJ/Z* Coil Part No.	EG Coil Part No.	EG/Z* Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4306112	4305912	4305862	4305872	12 VDC	8.8 ohms	1.4 amps	17.2 watts	136 g. (4.8 oz.)
4306124	4305924	4305864	4305874	24 VDC	33.8 ohms	0.7 amps	16.6 watts	136 g. (4.8 oz.)

* Models with Zener Diode

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)



10-SIZE SERIES E COILS (Also for use on 12, 16, 20, 38 and 58 size poppet valves and 90-size spool valves)

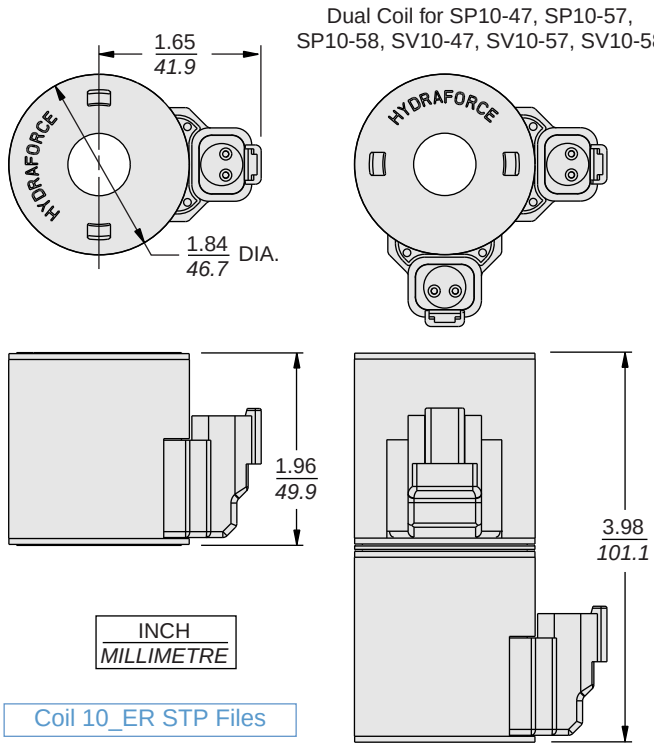


Coil 10_EY STP Files

EY

IP69K Rated 10-Size Coil
Thermal Shock Dunk Test Rated Coil
Metri-Pack® 150 Connector

Mating Connector: Delphi Packard No. 12052641; HF Part No. 6110119



Coil 10_ER STP Files

ER

IP69K Rated 10-Size Coil
Thermal Shock Dunk Test Rated Coil
Deutsch DT04-2P Connector

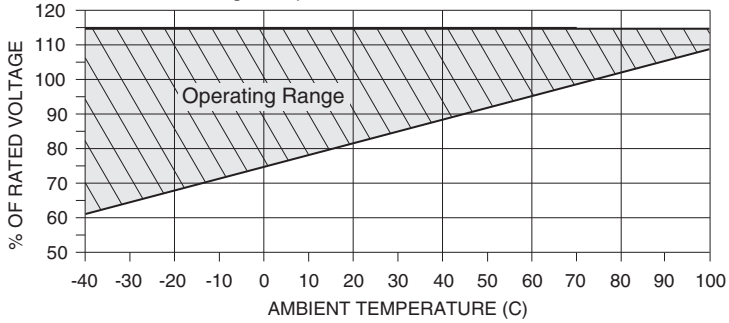
Mating Connector: Deutsch No. DT06-2S; HF Part No. 4001417

EY Coil Part No.	EY/Z* Coil Part No.	ER Coil Part No.	ER/Z* Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4303510	4303910	4303710	4304110	10 VDC	5.0 ohms	2.0 amps	20.0 watts	408 g. (14.4 oz.)
4303512	4303912	4303712	4304112	12 VDC	7.1 ohms	1.7 amps	20.5 watts	408 g. (14.4 oz.)
4303520	—	4303720	4304120	20 VDC	19.1 ohms	1.0 amps	19.1 watts	408 g. (14.4 oz.)
4303524	4303924	4303724	4304124	24 VDC	28.5 ohms	0.8 amps	18.2 watts	408 g. (14.4 oz.)

* Models with Zener Diode

Please note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)

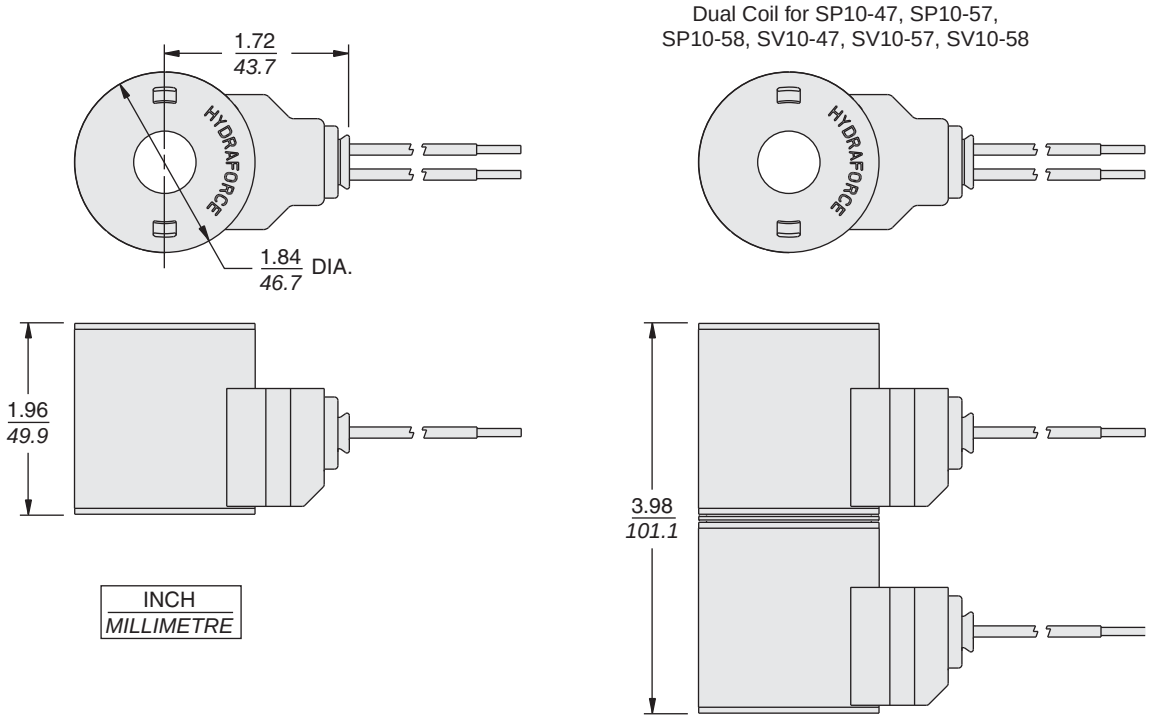
CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage Required for Pull-In; 32 cSt/150 sus oil at 40°C



Blue rectangles are links to other catalog pages or files.

Series E Environmental Coils

10-SIZE SERIES E COILS (Also for use on 12-size poppet valves and 16-size poppet valves)



EL

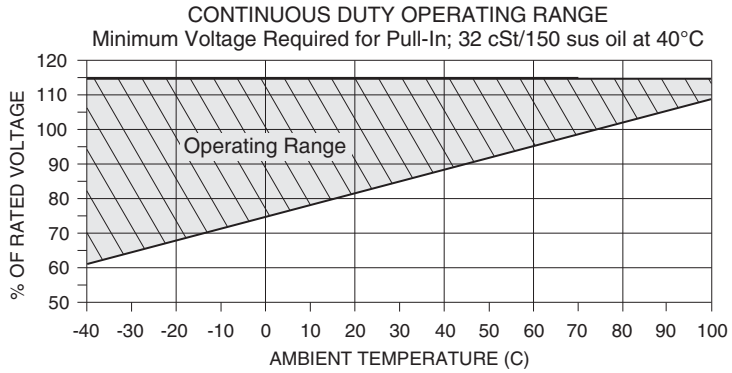
IP69K Rated 10-Size Coil — Thermal Shock Dunk Test Rated Coil

Coil 10_EL STP Files

EL Coil 36" Wire Part No.	EL Coil 18" Wire Part No.	EL/Z* Coil 18" Wire Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4317210	4305710	—	10 VDC	5.0 ohms	2.0 amps	20.0 watts	408 g. (14.4 oz.)
4317212	4305712	4307112	12 VDC	7.1 ohms	1.7 amps	20.5 watts	408 g. (14.4 oz.)
—	4305720	—	20 VDC	19.1 ohms	1.0 amps	19.1 watts	408 g. (14.4 oz.)
4317224	4305724	4307124	24 VDC	28.5 ohms	0.8 amps	18.2 watts	408 g. (14.4 oz.)

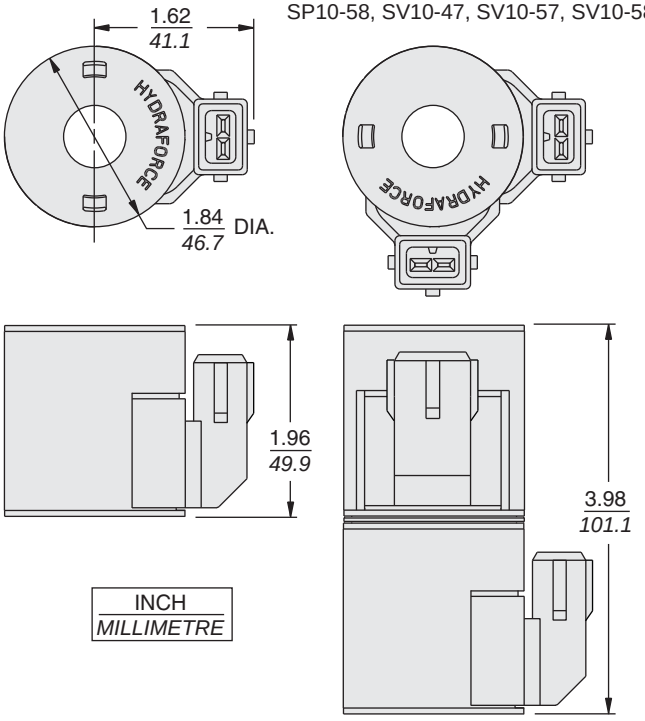
* Models with Zener Diode

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)



10-SIZE SERIES E COILS (Also for use on 12-size poppet valves and 16-size poppet valves)

Dual Coil for SP10-47, SP10-57, SP10-58, SV10-47, SV10-57, SV10-58

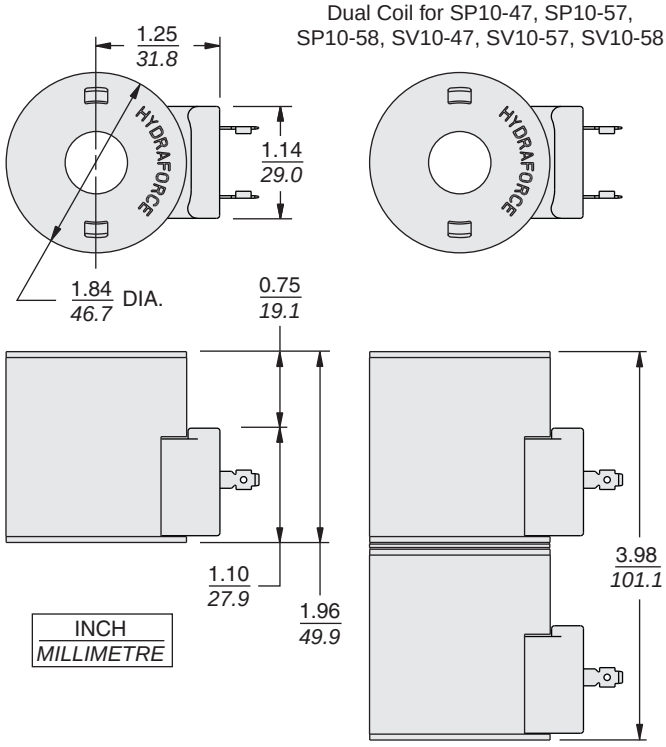


EJ

IP67 Rated 10-Size Coil
Amp Jr. Timer Connector

Coil 10_EJ STP Files

Dual Coil for SP10-47, SP10-57, SP10-58, SV10-47, SV10-57, SV10-58



EG

IP65 Rated 10-Size Coil; DIN 43650 Connector
IP67 rated if used with sealed mating connector and gasket

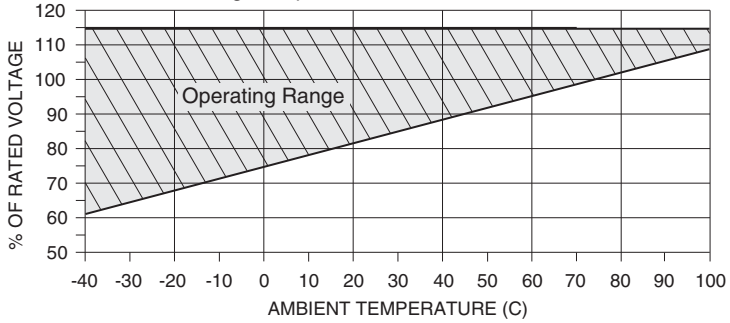
Coil 10_EG STP Files

EJ Coil Part No.	EJ/Z* Coil Part No.	EG Coil Part No.	EG/Z* Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
—	—	4305881	4305891	10 VDC	5.0 ohms	2.0 amps	20.0 watts	408 g. (14.4 oz.)
4305612	4305412	4305882	4305892	12 VDC	7.1 ohms	1.7 amps	20.5 watts	408 g. (14.4 oz.)
—	—	4305883	4305893	20 VDC	19.1 ohms	1.0 amps	19.1 watts	408 g. (14.4 oz.)
4305624	4305424	4305884	4305894	24 VDC	28.5 ohms	0.8 amps	18.2 watts	408 g. (14.4 oz.)

* Models with Zener Diode

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)

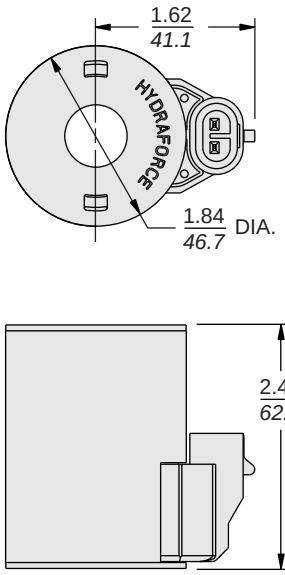
CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage Required for Pull-In; 32 cSt/150 sus oil at 40°C

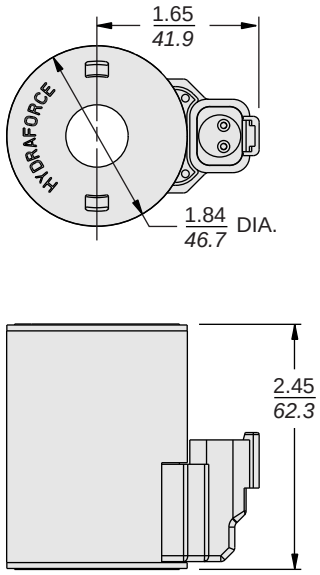


Blue rectangles are links to other catalog pages or files.

Series E Environmental Coils

70-SIZE SERIES E COILS (For use on PFR and PV valves and on 10-, 12- and 16-size valves.)





EY

IP69K Rated 70-Size Coil
Thermal Shock Dunk Test Rated Coil
Metri-Pack® 150 Connector

Mating Connector: Delphi Packard No. 12052641
HF Part No. 6110119

Coil 70_EY STP Files

ER

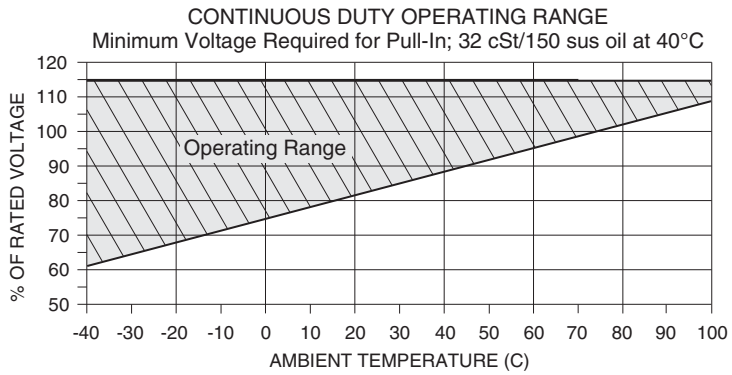
IP69K Rated 70-Size Coil
Thermal Shock Dunk Test Rated Coil
Deutsch DT04-2P Connector

Mating Connector: Deutsch No. DT06-2S
HF Part No. 4001417

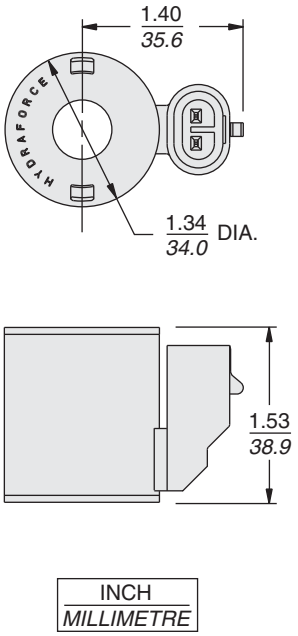
Coil 70_ER STP Files

EY Coil Part No.	ER Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4303112	4303212	12 VDC	4.5 ohms	2.7 amps	32.8 watts	408 g. (14.4 oz.)
4303124	4303224	24 VDC	17.9 ohms	1.3 amps	30.3 watts	408 g. (14.4 oz.)

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils.
(Refer to page 3.200.1 for standard coil specifications.)



EHPR-SIZE SERIES E COILS (Also for use on TS08-27, PV08 and 42-size valves.)

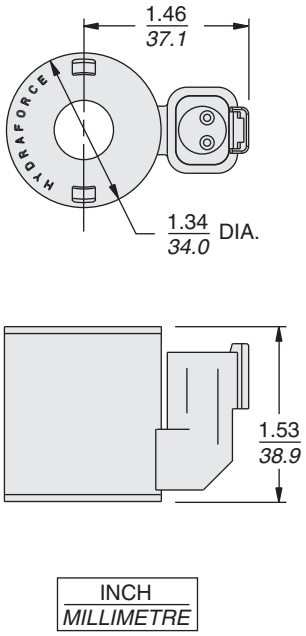


EY

IP69K Rated 08-Size Coil
Thermal Shock Dunk Test Rated Coil
Metri-Pack® 150 Connector

Mating Connector: Delphi Packard No. 12052641
HF Part No. 6110119

Coil EHPR_EY STP Files



ER

IP69K Rated 08-Size Coil
Thermal Shock Dunk Test Rated Coil
Deutsch DT04-2P Connector

Mating Connector: Deutsch No. DT06-2S
HF Part No. 4001417

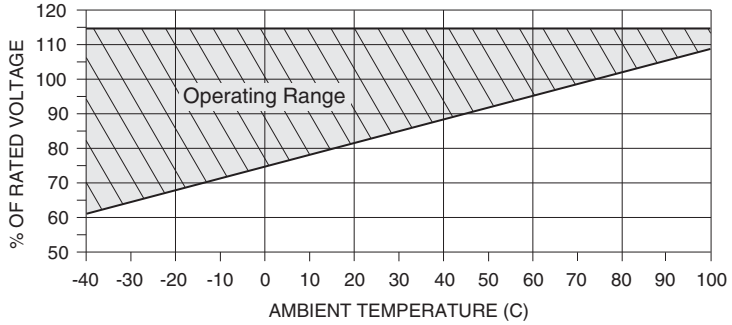
Coil EHPR_ER STP Files

EY Coil Part No.	ER Coil Part No.	ER/Z* Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
4304812	4304712	4320712	12 VDC	5.4 ohms	2.2 amps	26.1 watts	136 g. (4.8 oz.)
4304824	4304724	4320724	24 VDC	21.7 ohms	1.1 amps	26.3 watts	136 g. (4.8 oz.)

* Models with Zener Diode

Note: Electrical specifications for Series E coils differ from those for standard HydraForce coils. (Refer to page 3.200.1 for standard coil specifications.)

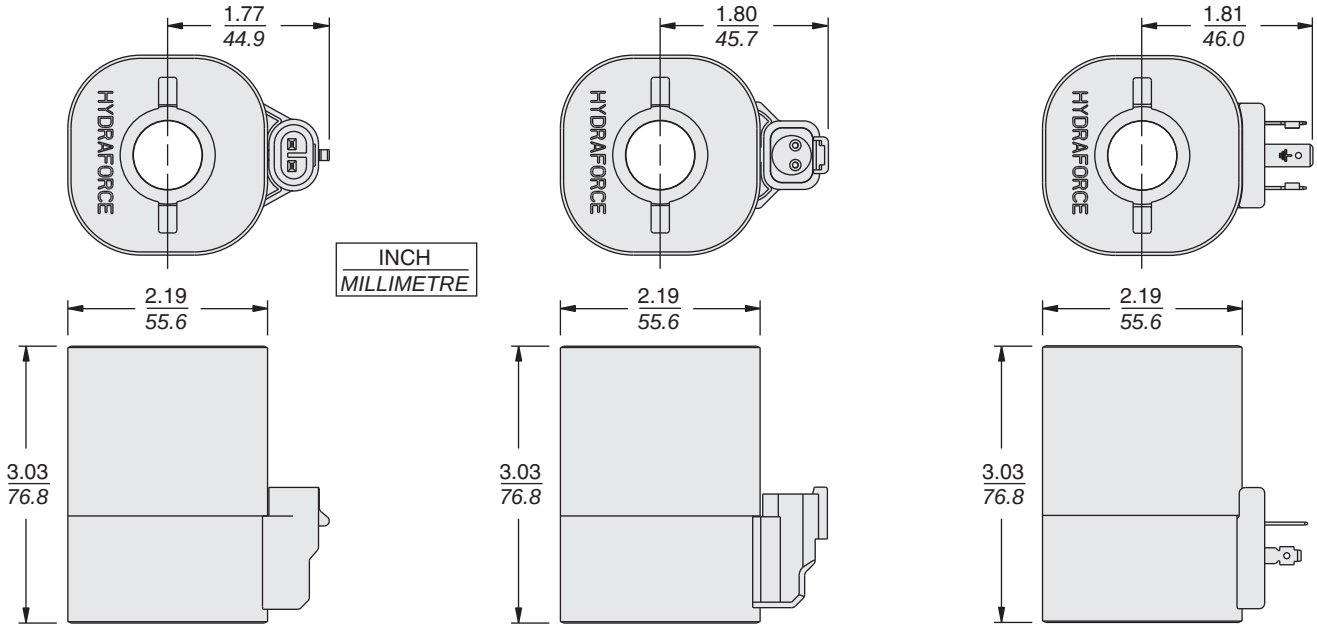
CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage Required for Pull-In; 32 cSt/150 sus oil at 40°C



Blue rectangles are links to other catalog pages or files.

Series E Environmental Coils

12-SIZE SERIES E COILS (For 12 Size Spool Valves Only)



Coil 12_EY STP Files

Coil 12_ER STP Files

Coil 12_EG STP Files

EY

IP69K Rated 12-Size Coil
Thermal Shock Dunk Test Rated
Metri-Pack® 150 Connector

Mating Connector:
Delphi Packard No. 12052641
HF Part No. 6110119

ER

IP69K Rated 12-Size Coil
Thermal Shock Dunk Test Rated
Deutsch DT04-2P Connector

Mating Connector:
Deutsch No. DT06-2S — HF Part No. 4001417

EG

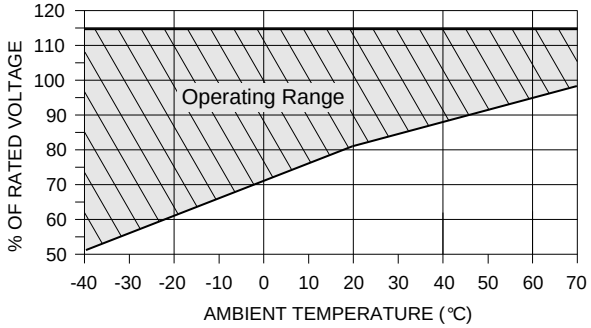
IP65 Rated 12-Size Coil
DIN 43650 Connector

Can be IP67 rated if used with sealed mating connector and gasket

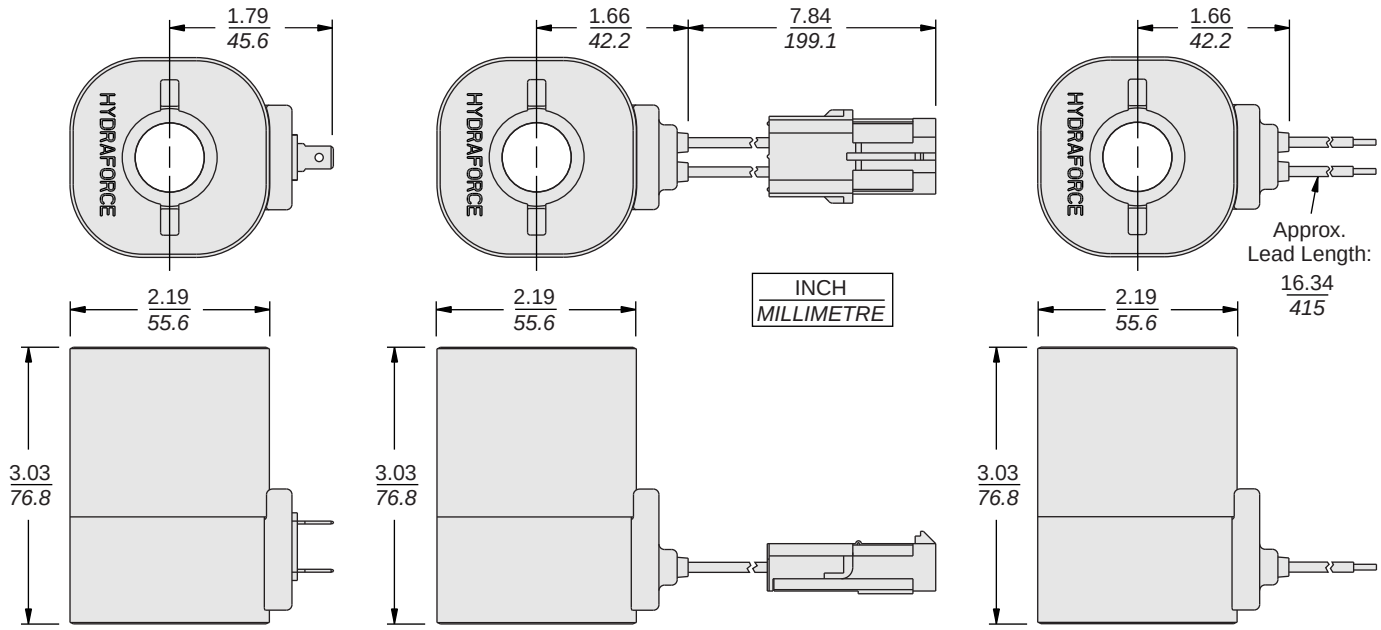
EY Coil Part No.	EY/Z* Coil Part No.	ER Coil Part No.	ER/Z* Coil Part No.	EG Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
6964012	4302206	4301212	4305512	6956012	12 VDC	4.6 ohms	2.6 amps	31.1 watts	1 kg. (2.2 lbs.)
6964024	4302207	4301224	4305524	6956024	24 VDC	18.3 ohms	1.3 amps	31.0 watts	1 kg. (2.2 lbs.)

* Models with Zener Diode

CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage at the Coil Required for Pull-In
32 cSt/150 ssu oil at 40°C



12-SIZE SERIES E COILS (For 12 Size Spool Valves Only)



ES

IP65 Rated 12-Size Coil
Dual Spades SAE J858a

Coil 12_ES STP Files

EW

IP65 Rated 12-Size Coil
Dual 18 Gauge Leads
with Weather-Pack® Connector

Mating Connector: Delphi Packard No. 12015792

Coil 12_EW STP Files

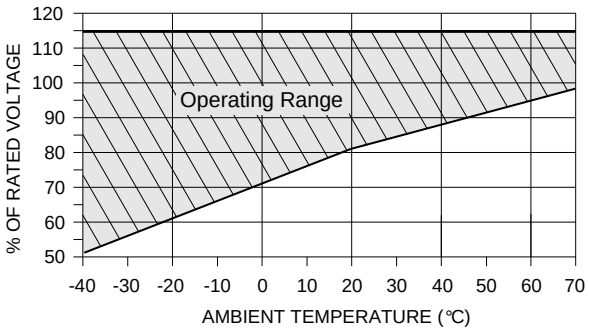
EL

IP65 Rated 12-Size Coil
Dual Leads – 18 Gauge

Coil 12_EL STP Files

ES Coil Part No.	EW Coil Part No.	EL Coil Part No.	Operating Voltage	Resistance at 20°C	Initial Current Draw	Power	Coil Weight
—	—	6852010	10 VDC	3.2 ohms	3.1 amps	31.2 watts	1 kg. (2.2 lbs.)
6851012	6853012	6852012	12 VDC	4.6 ohms	2.6 amps	31.1 watts	1 kg. (2.2 lbs.)
6851024	6853024	6852024	24 VDC	18.3 ohms	1.3 amps	31.0 watts	1 kg. (2.2 lbs.)

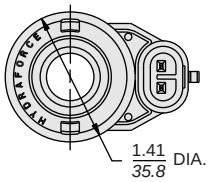
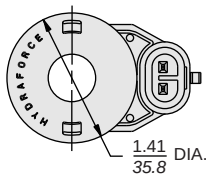
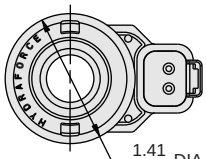
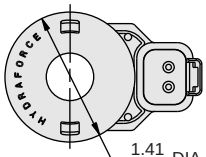
CONTINUOUS DUTY OPERATING RANGE
Minimum Voltage at the Coil Required for Pull-In
32 cSt/150 ssu oil at 40°C

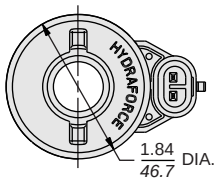
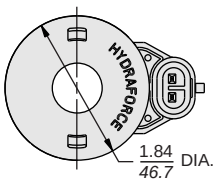
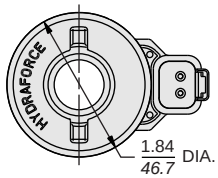
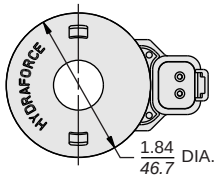


Blue rectangles are links to other catalog pages or files.

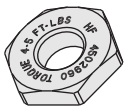
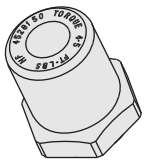
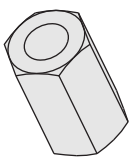
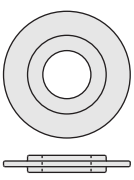
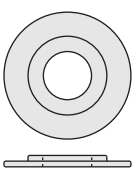
Series E Environmental Coils

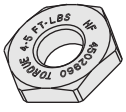
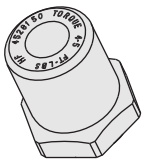
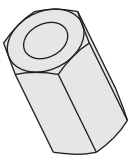
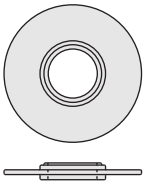
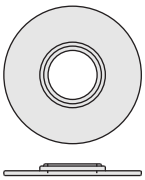
SERIES E COILS PART NUMBER CROSS REFERENCE

08-Size E-Coils	Original Design Manuf. before 1-1-04	New Design Manuf. after 1-1-04
Code EY Metri-Pack® 150 Connector **Top view shown** w/o retaining nut	 1.41 / 35.8 DIA.	 1.41 / 35.8 DIA.
10 VDC	4300110	4303410
12 VDC	4300112	4303412
20 VDC	—	4303420
24 VDC	4300124	4303424
Code ER Deutsch DT04-2P Connector **Top view shown** w/o retaining nut	 1.41 / 35.8 DIA.	 1.41 / 35.8 DIA.
10 VDC	4300310	4303610
12 VDC	4300312	4303612
20 VDC	—	4303620
24 VDC	4300324	4303624

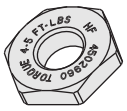
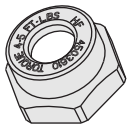
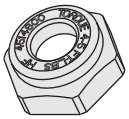
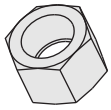
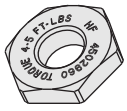
10-Size E-Coils	Original Design Manuf. before 1-1-04	New Design Manuf. after 1-1-04
Code EY Metri-Pack® 150 Connector **Top view shown** w/o retaining nut	 1.84 / 46.7 DIA.	 1.84 / 46.7 DIA.
10 VDC	4300210	4303510
12 VDC	4300212	4303512
20 VDC	—	4303520
24 VDC	4300224	4303524
Code ER Deutsch DT04-2P Connector **Top view shown** w/o retaining nut	 1.84 / 46.7 DIA.	 1.84 / 46.7 DIA.
10 VDC	4300410	4303710
12 VDC	4300412	4303712
20 VDC	—	4303720
24 VDC	4300424	4303724

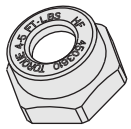
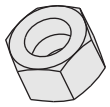
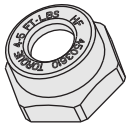
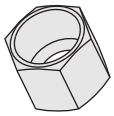
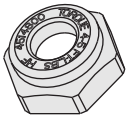
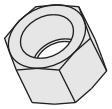
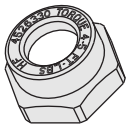
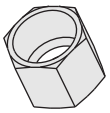
SERIES E COIL NUT & SPACER CROSS REF. FOR SPxx-47 & SVxx-47 DUAL SOLENOID VALVES

For SP08-47 & SV08-47 Series Valves	Retaining Nut and Spacer for Original E-Coil Design Manuf. before 1-1-04	Retaining Nut and Spacer for New E-Coil Design Manuf. after 1-1-04
Retaining Nut for SP08-47's & SV08-47's without Manual Override **Part Number:**	 Nut: 4502960	 Nut: 7004400
Retaining Nut for SP08-47M's & SV08-47M's with Manual Override **Part Number:**	 Nut: 4528150	 Nut: 4528180
Coil Spacer for all SP08-47 & SV08-47 Series Valves (installs between the two coils) **Part Number:**	 1.41 / 35.8 O.D. Spacer: 4514810	 1.41 / 35.8 O.D. Spacer: 4534720

For SP10-47 & SV10-47 Series Valve	Retaining Nut and Spacer for Original E-Coil Design Manuf. before 1-1-04	Retaining Nut and Spacer for New E-Coil Design Manuf. after 1-1-04
Retaining Nut for SP10-47's & SV10-47's without Manual Override **Part Number:**	 Nut: 4502960	 Nut: 7004400
Retaining Nut for SP10-47M's & SV10-47M's with Manual Override **Part Number:**	 Nut: 4527160	 Nut: 4527540
Coil Spacer for all SP10-47 & SV10-47 Series Valves (installs between the two coils) **Part Number:**	 1.84 / 46.6 O.D. Spacer: 4514130	 1.84 / 46.6 O.D. Spacer: 4539700

SERIES E COIL NUT CROSS REFERENCE

Valve Models	Retaining Nuts for Original E-Coil Design Manufactured before 1-1-04	Retaining Nuts for New E-Coil Design Manufactured after 1-1-04
SF08-20 SV08-33 SP08-20 SV08-40 SV08-20 SV08-41 SV08-22 SV08-42 SV08-24 SV08-43 SV08-25 SV08-44 SV08-26 SV08-45 SV08-31 SV08-46	 Nut: 4502960	 Nut: 7004400
SF08-20M/J/Y SV08-20M/J/Y SV08-22M/J/Y SV08-24M/J/Y SV08-25M/J/Y SV08-26M/J/Y SV08-31M/J/Y SV08-33M/J/Y SV08-40M/J/Y SV08-41M/J/Y SV08-42M/J/Y SV08-43M/J/Y SV08-44M/J/Y SV08-45M/J/Y SV08-46M/J/Y	 Nut: 4626260-1	 Nut: 7004490
SF08-21 SV08-21 SV08-21P/K SV08-23 SV08-23P/K	 Nut: 4514800	 Nut: 7004410
SP10-20 SV10-40 SP10-41 SV10-41 SP10-46R SV10-42 SP12-20 SV10-43 SV10-20 SV10-44 SV10-22 SV10-45 SV10-24 SV12-20 SV10-25 SV12-22 SV10-30 SV16-20 SV10-31 SV16-22 SV10-33 SV38-20 SV10-34 SV58-xx	 Nut: 4502960	 Nut: 7004400

Valve Models	Retaining Nuts for Original E-Coil Design Manufactured before 1-1-04	Retaining Nuts for New E-Coil Design Manufactured after 1-1-04
SF10-20M/J/Y SV10-22M/J/Y SV10-24M/J/Y SV10-25M/J/Y SV10-30M/J/Y SV10-31M/J/Y SV10-33M/J/Y SV10-34M/J/Y SV10-40M/J/Y SV10-41M/J/Y SV10-42M/J/Y SV10-43M/J/Y SV10-44M/J/Y SV10-45M/J/Y SV38-20M/J/Y SV58-xxM/J/Y	 Nut: 4626260-2	 Nut: 7004590
SP10-24 SV10-21 SV10-21P/K SV10-23 SV10-23P/K SV38-38 SV38-38P/K	 Nut: 4503610	 Nut: 7004420
TS08-20 TS80-30 TS98-30 TS98-31	 Nut: 4514800	 Nut: 7004410
TS10-26 TS10-36 TS12-26 TS12-36 TS38-20	 Nut: 4526330	 Nut: 4540560
TS10-27 TS12-27 TS38-21	 Nut: 4519810	 Nut: 4540550