

Coils

Coils for Solenoid and Proportional Valves



Coils

COIL INFORMATION	C-3
TOUGHCOILS	C-4
LARGE TOUGHCOILS	C-9
C13 AND C16 SERIES COILS	C-11
EPV SERIES COILS	C-13
EFV SERIES COILS	C-14
EXPLOSION PROOF VALVES	C-15

Coils

Information

Coils

Eaton Coils have been designed to provide industry leading environmental protection and solenoid performance in a compact and rugged package. Coils with integrated connectors are rated from IP65 up to IP69K environmental protection. Eaton coils are available with a variety of popular integrated connection options and with wire leads. The best in class, one-piece, shell encapsulated, design meets the most stringent environmental requirements for mobile and industrial applications. The exclusive compact coil design from Eaton, offers the advantage of field retrofit ability on all existing, and new, applications.



Toughcoil & Large Toughcoils

Toughcoils and Large Toughcoils meet an environmental rating of up to IP69K, depending on the connector chosen. An IP69K rating validates product with high-pressure jet streams, high liquid temperatures and underwater submersion. IP69K protection is standard on coils with MetriPac or Deutsch, integrated connectors. Toughcoils have been qualified to withstand the toughest Mobile Equipment "Thermal Shock Dunk" tests. Toughcoils are available for most 8, 10, 12, 16 and 20 series valves.



C13 & C16

The coil/tube joint is sealed by "O" rings preventing fluid ingress and the possibility of tube corrosion. Different electrical connectors offer different levels of protection the minimum being the DIN 43650 connector with a gasket at IP65. The coil winding is copper magnet wire insulation equivalent to class N (200°C). The coil is rated for continuous operation at nominal voltage +/- 10% and an ambient range of -30 to +155°C. For AC voltage an ISO4400 rectified connector must be used, as the coils are wound for DC.

Corrosion Resistance

Developed with renewable energy applications in mind, this plating has been engineered to surpass the ISO 12944-2 requirements for use in C4H level corrosive exterior atmospheres. It allows coils to operate for a significantly longer period of time in outdoor, harsh weather, high humidity environments. In neutral salt spray tests conducted to ASTM B117 and ISO 9227 standards, the Zinc Nickel plating will go 1000 hours before showing any signs of rust or corrosion. Contact your Eaton representative to inquire about 1000+ hour ZnNi plating options.

Nickel Plating: 24 hours

Zinc Plating: 250 hours

Traditional Zinc-Nickel Plating: 500 hours

Improved Zinc-Nickel Plating: 1000+ hours

Note: Please refer to the Electronic Controls & Software catalog, found in Power Source, for information on coil controls including HFX, EHH Power Plug, etc.

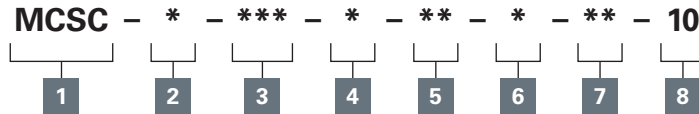


HFX Product Family

The Eaton HFX product family is a series of advanced, CAN-based controllers for use with mobile and industrial equipment. Using C programming, these controllers enable functional control over electrically operated components within a variety of applications (e.g. agricultural, construction, material handling). The HFX product family is optimized for reliable operation in severe environments, possessing IP and temperature ratings that exceed existing solutions from competitors. HFX controllers employ several advanced technologies (e.g. I/O with variable configuration architecture), enabling simple management and enhancing both ease of use and functionality. These controllers are intended as both a standalone solution, or as the centerpiece to a complete control system that can include other CAN-based devices such as displays and keypads.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code



1 Function

MCSC - Solenoid coil

2 Series

S - Size 8 (210 Bar)
P - Size 8 (350 Bar)
J - Size 10, 12, 16, 20 (210 Bar)
H - Size 10, 12, 16, 20 (350 Bar)

3 Voltage rating

012 - 12 volt
024 - 24 volt
115 - 115 volt
230 - 230 volt

4 Voltage type

D - DC
B - DC/with flyback diode
A - AC/with full bridge rectifier

5 Connector

G0 - ISO 4400 DIN 43650
W0 - Flying lead
N0 - Deutsch Male, DT04-2P, Integrated (DC Only)
 Mating Connector: Deutsch DT06-2S
Y0 - Integrated (DC Only)
 Mating Connector: AMP 963040-3 or equivalent
D0 - MetriPack® 150 Male, Integrated (DC Only)
 Mating Connector: Delphi 12052641

J0 - MetriPack® 280 Male, Integrated (DC Only)
 Mating Connector: Delphi 15300027

E0 - Weather-Pack (Packard) female on wire leads
 Mating Connector: Delphi 12010973

F0 - Weather-Pack (Packard) male on wire leads
 Mating Connector: Delphi 12015792

Note: Auxillary parts forming connectors may be required.

6 Lead length

0 - None
A - 152mm [6.0 in] (Standard length with connector)
B - 610mm [24.0 in] (Standard length without connector)

7 Special features

00 - None (Only required if valve has special features, omitted if "00.")

8 Design code

10 - Design code

Specifications

Ratings and specifications

Duty Rating	Continuous from 85% to 110% of nominal voltage
Operating temperature	100°C (212°F) continuous @ nominal voltage
Lead Wires	18 gauge, standard 610 mm (24") long, UL style 3173 CSA CL 1251 (meets SAE J1128 XLPE style SXL) S Series: 20W P Series: 23W J Series: 23W H Series: 29W
Power Rating	
Encapsulant	Glass filled nylon
Magnet Wire	U.L. class N, 200°C (392°F) NEMA pub. No. MW 1000, section MW 35 – C (single)
Flyback diode (arc suppressor)	Maximum recurrent peak reverse voltage – 800 V (optional)

Environmental protection

Connector	Ip65	Ip67	Ip69k	Thermal shock dunk
G0: DIN 43650	X*			
Y0: Amp Jr.	X	X*		
W0: Wire Leads	X	X		X ¹
N0: Deutsch	X	X	X	X
D0: Metri-Pack 150	X	X	X	X
J0: Metri-Pack 280	X	X	X	X

*Rating dependent on mating connector

Caution

Coils may be hot to touch if used in continuous duty applications.

**Additional coil information upon request

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Toughcoils

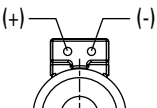
For 8 size solenoid valves
S & P series coils

S Series Toughcoils part numbers - 300AA00_____ (Complete part number is 11 Digits)

Voltage	G0**	W0	N0	Y0	D0	J0	E0	F0
12VDC	001A	015A	021A	026A	031A	036A	182A	161A
24VDC	002A	016A	022A	027A	032A	037A	270A	250A
115VAC	005A	–	–	–	–	–	–	–
230VAC	006A	–	–	–	–	–	–	–
12VDC***	007A	019A	024A	029A	034A	039A	266A	177A
24VDC***	008A	020A	025A	030A	035A	040A	176A	379A

P Series Toughcoils part numbers - 300AA00_____ (Complete part number is 11 Digits)

Voltage	G0**	W0	N0	Y0	D0	J0	E0	F0
12VDC	041A	055A	061A	066A	071A	076A	–	175A
24VDC	042A	056A	062A	067A	072A	077A	–	372A
115VAC	045A	–	–	–	–	–	–	–
230VAC	046A	–	–	–	–	–	–	–
12VDC***	047A	059A	064A	069A	074A	079A	–	178A
24VDC***	048A	060A	065A	070A	075A	080A	–	–

Std. voltages	S series Amperes*	P series Amperes*	Voltage Type B
12 DC	1.92	1.67	
24 DC	0.96	0.83	
115 AC	0.22	0.19	
230 AC	0.11	0.10	

*Nominal voltage 25°C (77°F).

**DIN 43560 mating connector for “G0” style coil – 02-166796.

***With flyback diode. (Voltage Type B)

For other voltages and connectors contact your Eaton representative.

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

J Series Toughcoils part numbers - 300AA00_____ (Complete part number is 11 Digits)

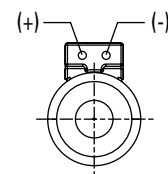
Voltage	G0**	W0	N0	Y0	D0	J0	E0	F0
12VDC	081A	095A	101A	106A	111A	116A	185A	172A
24VDC	082A	096A	102A	107A	112A	117A	201A	255A
115VAC	085A	–	–	–	–	–	–	–
230VAC	086A	–	–	–	–	–	–	–
12VDC***	087A	099A	104A	109A	114A	119A	251A	179A
24VDC***	088A	100A	105A	110A	115A	120A	–	265A

H Series Toughcoils part numbers - 300AA00_____ (Complete part number is 11 Digits)

Voltage	G0**	W0	N0	Y0	D0	J0	E0	F0
12VDC	121A	135A	141A	146A	151A	156A	189A	163A
24VDC	122A	136A	142A	147A	152A	157A	162A	–
115VAC	125A	–	–	–	–	–	–	–
230VAC	126A	–	–	–	–	–	–	–
12VDC***	127A	139A	144A	149A	154A	159A	272A	180A
24VDC***	128A	140A	145A	150A	155A	160A	–	–

Std. voltages	J series Amperes*	H series Amperes*
12 DC	1.92	2.42
24 DC	0.96	1.21
115 AC	0.22	0.28
230 AC	0.11	0.14

Voltage type B



*Nominal voltage 25°C (77°F).

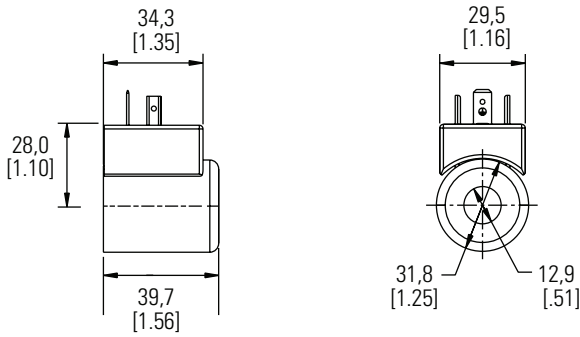
**DIN 43560 mating connector for “G0” style coil – 02-166796.

***With flyback diode. (Voltage Type B)

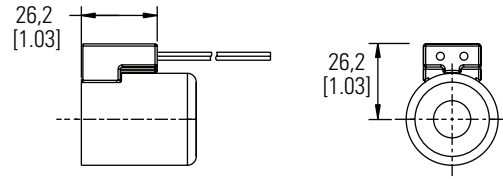
For other voltages and connectors contact your Eaton representative.

S and P Series coils

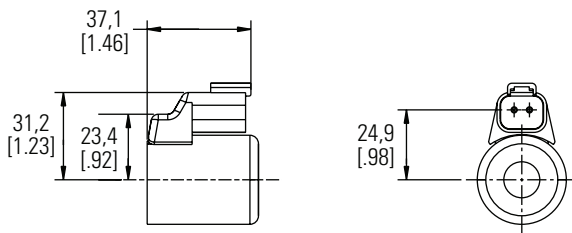
Dimensions



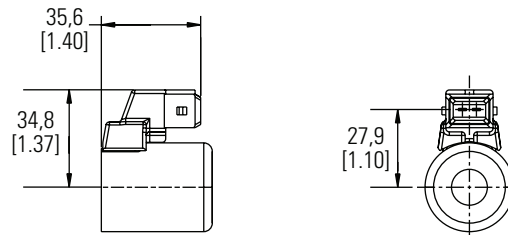
G0
DIN 43650-A Connector



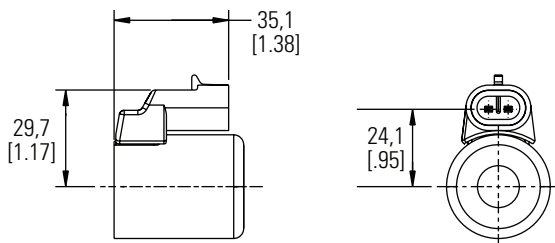
W0
Leadwire



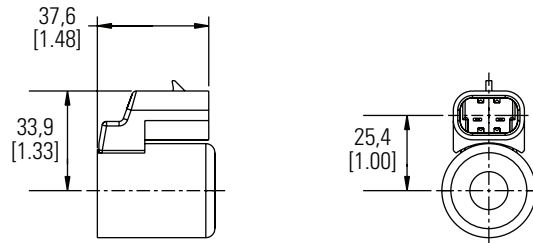
N0
Deutsch Male DTO4-2P integrated connector



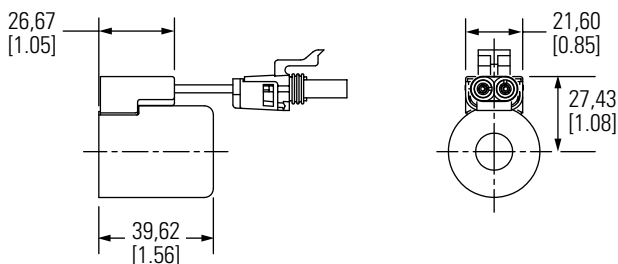
Y0
AMP Junior timer integrated connector



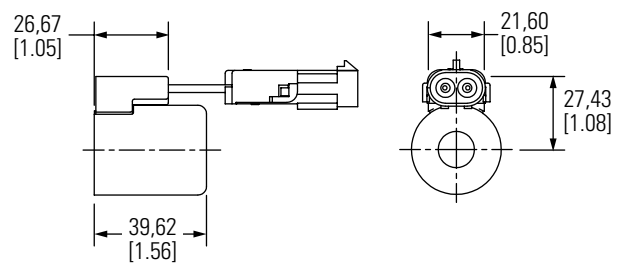
D0
Metri-Pack 150 Male, integrated connector



J0
Metri-Pack 280 Male, integrated connector



E0
Weather-Pack, Female

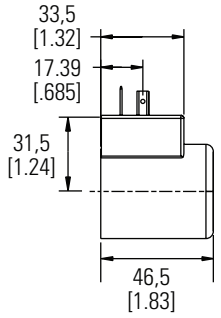


F0
Weather-Pack, Male

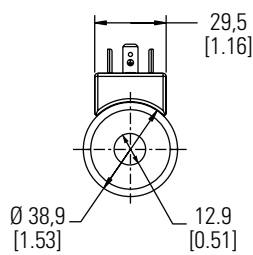
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

C

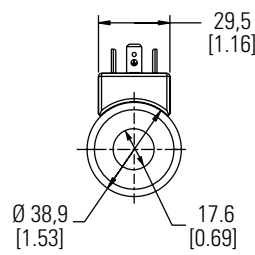
Dimensions



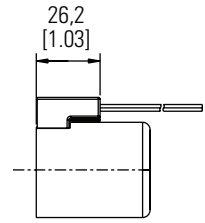
G0
DIN 43650-A Connector



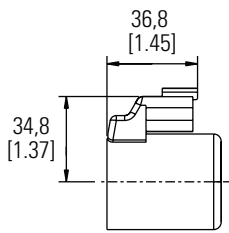
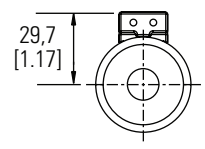
J Series



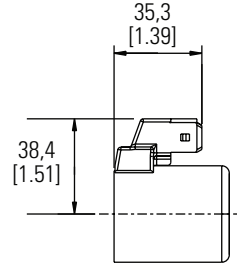
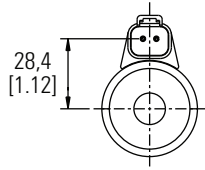
H Series



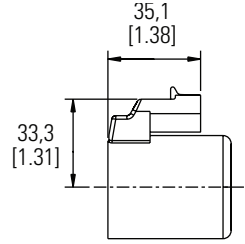
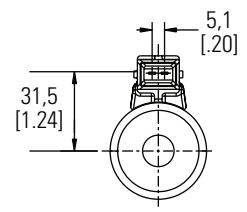
W0
Leadwire



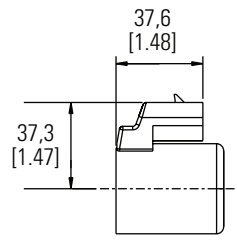
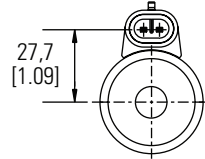
N0
Deutsch male DTO4-2P integrated connector



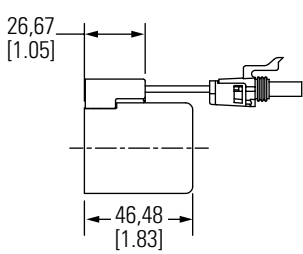
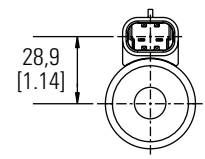
Y0
AMP Junior timer integrated connector



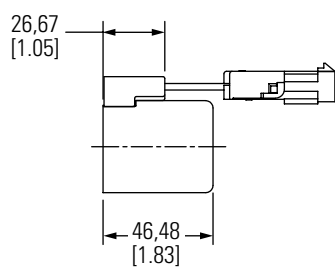
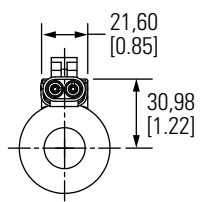
D0
Metri-Pack 150 Male, integrated connector



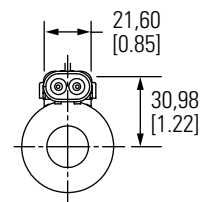
J0
Metri-Pack 280 Male, integrated connector



E0
Weather-Pack, Female



F0
Weather-Pack, Male

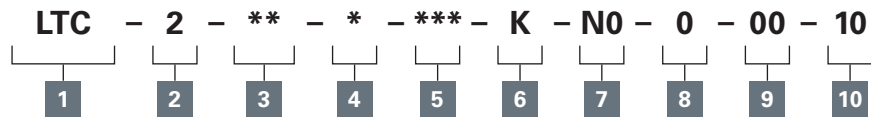


Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Large Toughcoils

Model Code LTC

Model code



<p>1 Function LTC - Solenoid coil</p> <hr/> <p>2 Control type 2 - Voltage Control (on/off)</p> <hr/> <p>3 Power rating AA - 30W (standard for R series) AG - 28W (standard for L series)</p>	<p>4 Series L - 10 size for ESV9 and SV9A valves (17.6mm inner diameter) R - 10 and 12 size used on SV*M solenoid valves (23.6mm inner diameter)</p> <hr/> <p>5 Voltage rating 012 - 12 volt 024 - 24 volt</p>	<p>6 Voltage type protection K - DC with no protection G - AC w/ full bridge rectifier M - DC w/ bi-directional Diode</p> <hr/> <p>7 Connector type G0 - ISO 4400 DIN 43650 N0 - Deutsch male, DT04-2P, integrated Y0 - Integrated Amp DC D0 - MetriPack® 150 Male, Integrated (DC Only) Mating connector : Delphi 12052641</p>	<p>8 Lead length 0 - None</p> <hr/> <p>9 Special features 00 - None</p> <hr/> <p>10 Design code 10 - Design code</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------

Specifications

Ratings and Specifications	
Duty Rating	Continuous from 85% to 110% of nominal voltage
Operating temperature	100°C (212°F) continuous @ nominal voltage
Power Rating	L Series: 28W R Series: 30W
Encapsulant	Glass filled nylon
Magnet Wire	U.L. class N, 200°C (392°F) NEMA pub. No. MW 1000, section MW 35 – C (single)

Environmental protection

Connector	Ip65	Ip67	Ip69k	Thermal shock dunk
G0: DIN 43650	X*			
Y0: Amp Jr.	X	X*		
N0: Deutsch	X	X	X	X
D0: Metri-Pack 150	X	X	X	X

⚠ Caution
Coils may be hot to touch if used in continuous duty applications.

*Large toughcoils replaces EN490, BLUE COILS. To convert to Large touch coils a large coil nut is required

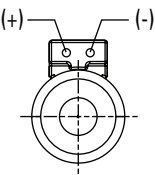
Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

L Series part numbers - 309AA00_____ (Complete part number is 11 Digits)

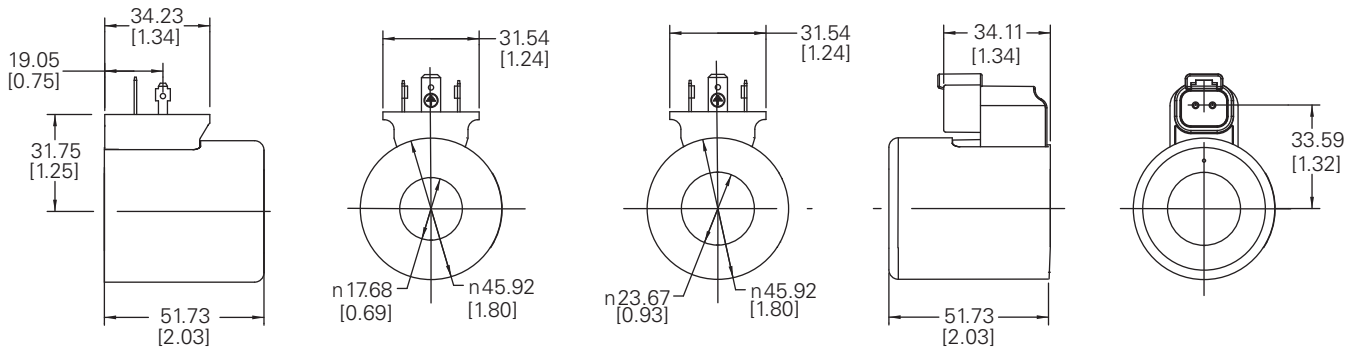
Voltage	GO	NO	YO	DO
12VCD	044A	041A	003A	010A
24VCD	045A	042A	038A	037A

R Series part numbers - 309AA00_____ (Complete part number is 11 Digits)

Voltage	GO	NO	YO	DO
12VCD	004A	001A	006A	009A
24VCD	024A	017A	021A	019A

Std. voltages	L series Amperes*	R series Amperes*	Voltage Type B
12 DC	2.35	2.50	
24 DC	1.17	1.25	

*Nominal voltage 25°C (77°F).

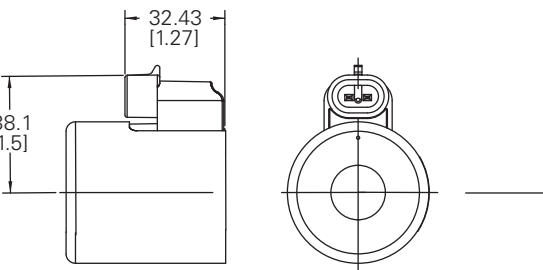


G0
DIN 43650-A Connector

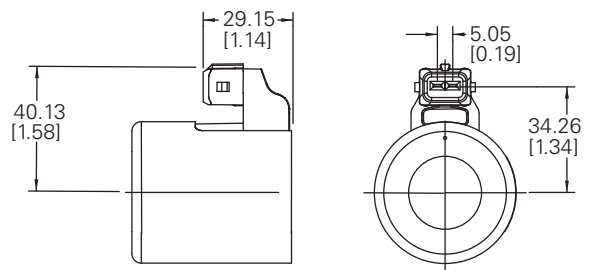
L Series

R Series

NO Deutsch Male DTO4-2P
integrated connector



DO Metri-Pack 150 Male, integrated connector

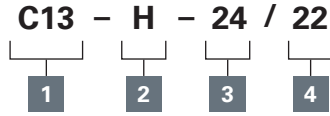


YO AMP Junior timer integrated connector

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

C13 and C16 coil

Model code



1 Coil Series

C13 - 13 mm tube
C16 - 16 mm tube

2 Connection

H - DIN43650 ISO Standard
F - Flying Leads
 (12 and 24 VDC only)
DM - Deutsch male,
 DT04-2P, integrated
 (12 & 24 VDC only)

3 Voltage

12	12 VDC
24	24 VDC
110	110 VRAC
220	220 VRAC*

*220 to 240 VAC
 All AC coils must be used with a rectifying connector:
 (AXP9997- 115 or AXP9997-230)
 (Other voltages available on request)

4 Power Rating

C13 -
14 = 14 Watt
22 = 22 Watt
27 = 27 Watt
C16 -
19 = 19 Watt
29 = 29 Watt

Specifications

Ratings and Specifications

Duty Rating	Continuous for 100% of nominal voltage of +/-10 %
Operating temperature	-30°C to 155°C
Power Rating	C13: 14 Watt, 22 Watt, 27Watt C16: 19 Watt, 29 Watt
Encapsulant	Black Polybutylene Reinforced & Black Polyarylamide Reinforced

Environmental protection

Connector	Ip54	Ip65	Ip67	Ip69k
F: Wire Leads	X			
H: DIN43650	X	X		
DM: Deutsch	X	X	X	X

⚠ Caution

Coils may be hot to touch if used in continuous duty applications.

C13 Series coils part numbers - 400AA00_____ (Complete part number is 11 Digits)

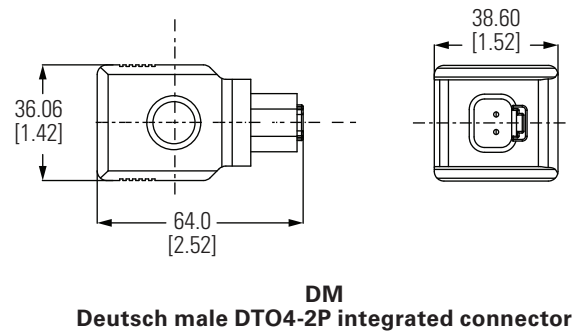
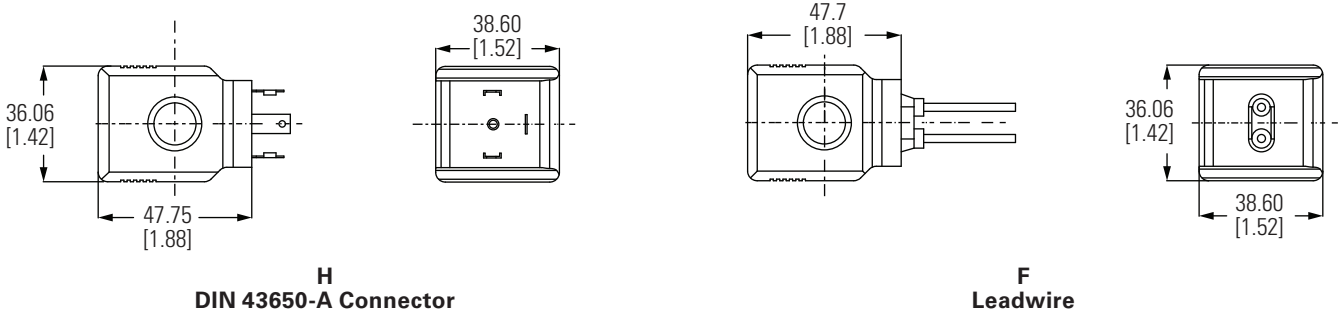
Voltage	H			F			DM		
	14 Watt	22 Watt	27 Watt	14 Watt	22 Watt	27 Watt	14 Watt	22 Watt	27 Watt
12	230A	002A	028A	230A	026A	028A	–	249A	–
14	008A	029A	044A	036A	037A	–	–	–	–
110	027A	038A	211A	–	–	–	–	–	–
220	041A	042A	212A	–	–	–	–	–	–

C16 Series coils part numbers - 400AA00_____ (Complete part number is 11 Digits)

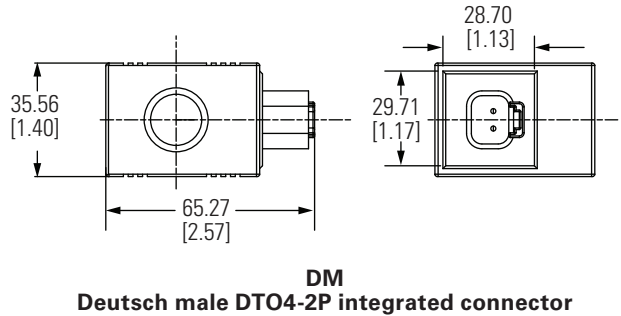
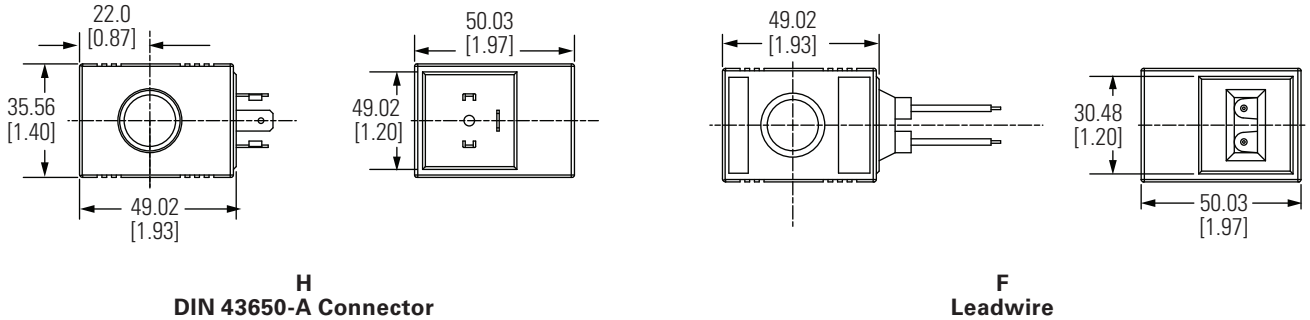
Voltage	H		F		DM	
	19 Watt	29 Watt	19 Watt	29 Watt	19 Watt	29 Watt
12	003A	005A	007A	052A	–	–
14	004A	006A	053A	270A	–	–
110	054A	055A	–	–	–	–
220	057A	213A	–	–	–	–

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

C13 Coils



C16 Coils



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Control and specifications

Rheostat	12 VDC operation 10-12 V, 20-25 watts 24 VDC operation 25-30 V, 20-25 watts
Power plug options	EHH-AMP-702, EPAD-SA-1A6-10 (Require 24 VDC power supply to power plug and 12 VDC coil)
Amplifier card	EEA-PAM-523 (Requires 24 VDC power supply and either 12VDC or 24 VDC coil)
Joystick suppliers	OEM Controls, Inc, Shelton, CT P-Q Controls, Inc, Bristol, CT

Std. voltages	Amperes*	Lead color	Power rating
12 DC	1.32	red	16 W
24 DC	.66	black	16 W

*Nominal voltage @ 25°C (77°F).

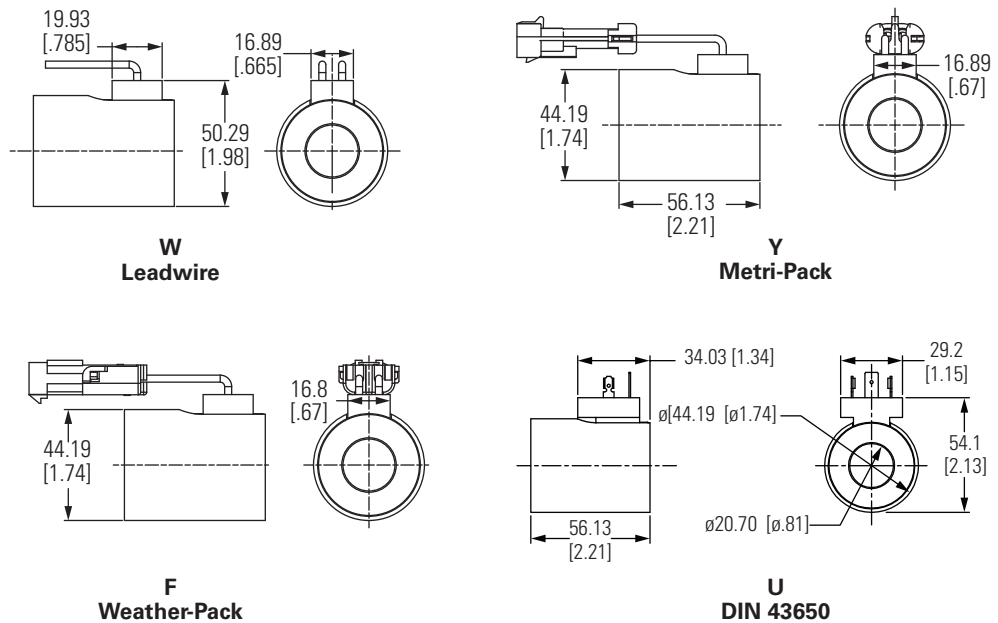
Coil part numbers

Voltage	F Connector	U* Connector	W Connector	Y Connector
12VDC	02-308810	02-154070	02-154072	02-308808
24VDC	02-308811	02-154071	02-154073	02-308809

*DIN 43650 mating connector for "U" style coil – 02-166796.

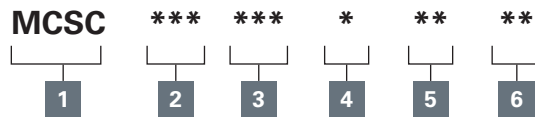
Coil configurations

⚠ Caution
Coils may be hot to touch if used in continuous duty applications.



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Coil model code



1 Function
MCSC - Solenoid Coil

2 Series
E - All EFV valves

3 Voltage rating
012 - 12 volt
024 - 24 volt

4 Voltage type
D - DC

5 Connector
G - ISO 4400 DIN 43650
W - Flying lead
C - Deutsch Male, DT04-2P,
On wire leads

6 Lead length
0 - None
06 - 6.0 inches (coil to connector or coil to lead ends as applicable)

Note: Auxiliary parts for mating connectors may be required.
DIN 43560 mating connector for "G" style coil – 02-166796.

Control and specifications

Power plug options	EHH-AMP-702 (Requires 24 VDC power supply to power plug and 12 VDC coil) EHH-AMP-712 (Requires 12 VDC power supply to power plug and 12 VDC coil)
DIN Rail Module	EHH-PAM-600 (Requires 24 VDC power supply and 12VDC)

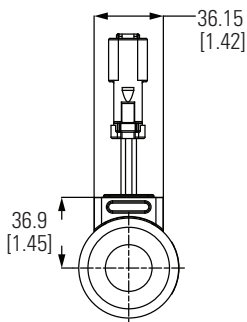
Caution
Coils may be hot to touch if used in continuous duty applications.

Specifications

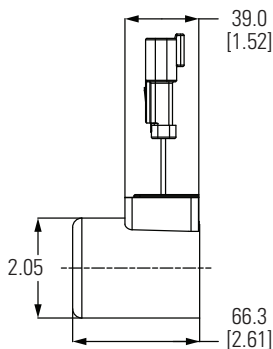
Standard Voltage	Resistance	Power
12 VDC	4.7 Ω	30 W
24 VDC	19.0 Ω	30 W

Coil kits

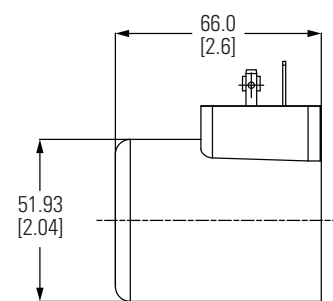
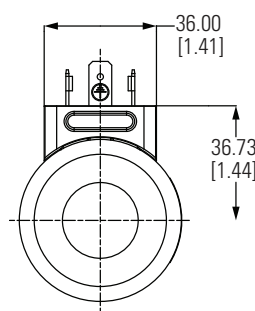
Standard coil	Part numbers
Model code	Assembly number
MCSC012DGE00	6034440-001
MCSC024DGE00	6034440-002
MCSC012DWE00	6034441-001
MCSC012DCE06	6034442-002



C
Deutsch Male



G
DIN 43650-A Connector



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Explosion Proof Valves

For hazardous environments Coil Options (SV*E Series)

Specifications

Specifications

Hydraulic Performance Specifications for explosion proof valves are the same as the base valve. For details please refer to the base valve page reference.

Coil temperature range	-40° to 100°C (-40° to 212°F)
Coil duty	Continuous from 85% to 110% of nominal voltage
Housing type	Explosion proof version with 1 /2" threaded conduit hub
Coil type	Epoxy encapsulated lead wire coil

Approvals

Approvals

UL	File AU2206, Component - Industrial truck accessory, Battery powered
CSA	Both for general purpose and Hazardous locations Class I, Group C & D Class II, Group E, F & G

Summary

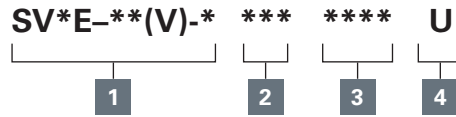
Model code reference	Description	Typical application pressure	Rated flow psi (bar)	Base Valve l/min (Usgpm)	Section design
SV1E-10-C-XX-XXXXU	2 way, 2 position, normally closed, poppet type	210 (3000)	45 (12)	SV1-10-C	A
SV1E-10-3-XX-XXXXU	3 way, 2 position, spool type	210 (3000)	23 (6)	SV1-10-3	A
SV1E-10-4-XX-XXXXU	4 way, 2 position	210 (3000)	23 (6)	SV1-10-4	A
SV1E-16-C-XX-XXXXU	2 way, 2 position, normally closed, poppet type	210 (3000)	132 (35)	SV1-16-C	A
SV2E-10-C-XX-XXXXU	2 way, 2 position, normally closed, poppet type	210 (3000)	23 (6)	SV2-10-C	A
SV2E-10-4-XX-XXXXU	4 way, 2 position, circuit center	210 (3000)	23 (6)	SV2-10-4	A
SV2E-20-C-XX-XXXXU	2 way, 2 position, normally closed, poppet type	210 (3000)	227 (60)	SV2-20-C	A
SV3E-10-C-XX-XXXXU	2 way, 2 position, normally closed, poppet type	210 (3000)	45 (12)	SV3-10-C	A
SV3E-10-0-XX-XXXXU	2 way, 2 position, normally open, poppet type	210 (3000)	45 (12)	SV3-10-0	A
SV3E-16-0-XX-XXXXU	2 way, 2 position, normally open, poppet type	210 (3000)	132 (35)	SV3-16-0	A
SV3E-20-0-XX-XXXXU	2 way, 2 position, normally open, poppet type	210 (3000)	227 (60)	SV3-20-0	A
SV4E-10-C-XX-XXXXU	2 way, 2 position, normally closed, spool type	210 (3000)	23 (6)	SV4-10-C	A
SV4E-10-0-XX-XXXXU	2 way, 2 position, normally open, spool type	210 (3000)	23 (6)	SV4-10-0	A
SV4E-10-4-XX-XXXXU	4 way, 2 position, tandem center	210 (3000)	23 (6)	SV4-10-4	A

Replacement coil part numbers

Voltage	Assembly number	Amperes (A)	Power(W)	Lead color
12 VDC	888831	1.50	20	Red
24 VDC	888832	0.75	20	Black
115 VAC	888838	0.16	20	Yellow
230 VAC	888840	0.08	20	Red/White

Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.

Model code



1 Base valve

- SV1 E-10-C - SV1-10-C
- SV1 E-10-3 SV1-10-3
- SV1 E-10-4 SV1-10-4
- SV1E-16-C SV1-16-C
- SV2E-10-C SV2-10-C
- SV2E-10-4 SV2-10-4
- SV2E-20-C SV2-20-C
- SV3E-10-C SV3-10-C
- SV3E-10-0 SV3-10-0
- SV3E-16-0 SV3-16-0
- SV3E-20-0 SV3-20-0
- SV4E-10-C SV4-10-C
- SV4E-10-0 SV4-10-0
- SV4E-10-4 SV4-10-4

For performance specifications refer to base valve data sheet. Viton® seal options are available.

2 Port size housing number

Refer to table in Model Code for Base valves 4.8 liters/min

3 Voltage*

Code	Voltage	Replacement Coil Part Number
12D	12VDC	888831
24D	24 DVC	888832
115A	115 VAC	888838
230A	230 VAC	888840

* Arc suppression diode is not available

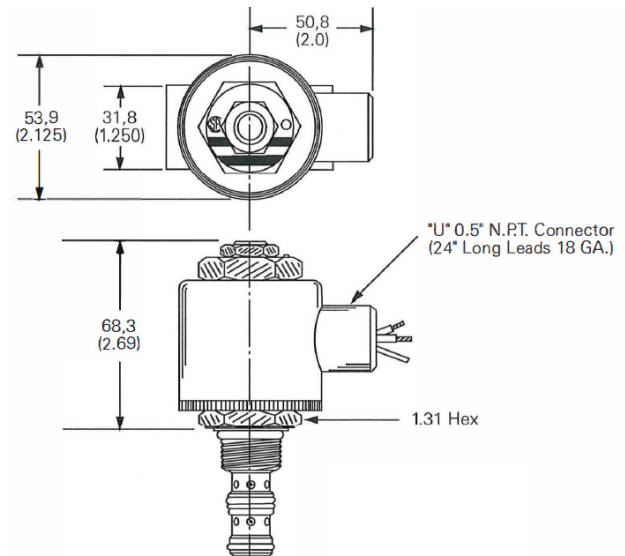
4 Type (C.S.A. Approved)

- U - 1/2" NPT Connector
- Class I, Group C & D
- Class II, Group E, F & G

Dimensions mm(inch)

Note: Cartridge only or coil housing are not available as service parts. It is not possible to convert standard valves to explosion proof variants. SV1 E-10-3 shown. Dimensions of coil housing are the same for all Vickers explosion proof SiCV valves, for other dimensions please refer to base valve datasheet.

Description type



Where measurements are critical request certified drawings. We reserve the right to change specifications without notice.