

Coils for Operating Solenoids of Valves

C*

Size 03, 04, 06, 10



Technical Features

- › Wide range of coil voltages
- › Wide range of connectors and electrical connection options
- › Easy replacement of coil solenoids
- › The coils can be rotated and the required connector direction can be adjusted
- › High resistance of coils against mechanical damage
- › Coils supplied with AC current, fitted with integrated rectifier
- › Coils with protection against possible damage due to induced voltage (Transil)

Technical Data

Quantity	Unit	Value
Nominal voltage (U_N)	V	see the list of voltages
Allowable voltage fluctuation		$U_N \pm 10\%$, if not stated otherwise in the valve data sheet
Coil current at U_N and 20 °C	A	see the table of coil types
Winding resistance at 20 °C	Ω	by calculation $R = U_N/I$
Input power of coil at 20 °C	W	by calculation $P = U_N \times I$
Max. ambient temperature	°C (°F)	50 (122), if not stated otherwise in the data sheet
Operation conditions		see the data sheets of individual types of valves
Max. winding temperature	°C (°F)	155 (311)
	Data sheet	Type
General information	GI_0060	products and general conditions
Connectors	K_8008	connectors EN 175301-803-A

Product Description

Valves designed for a change of fluid direction, such as directional control valves and poppet-type valves, are often solenoid operated. Proportional valves are another large group controlling continuously parameters in the circuit within the defined interval. Electric current flowing through the coil winding creates a magnetic field. This field acts on the armature of the solenoid part and allows its shift which is then transferred to the valve control element (spool, poppet). The excitation winding made of copper wire placed on a plastic core is the basis. The coil is inserted into the steel housing amplifying the magnetic field and to protect it against mechanical damage. Moreover, the coil is molded into the housing by plastic material. The connector part coupled with the coil is also made of the same plastic. A silicone seal protects the coil space against moisture and dust.

Coil Electrical Parameters

Standard control voltages are given in the table in the ordering code and coil currents are stated in the table of types. Electrical coil resistance is determined by the coil winding parameters. These along with input power of the coil can be calculated from the previous parameters. The coils are designed to be DC powered. When AC powered, it is necessary to use a coil with integrated rectifier or a connector plug with integrated rectifier.



In operation, the output power of coils is influenced both by keeping the given values of power supply and the operation conditions. Temperature rise of the winding causes an increase in its electrical resistance when exceeding operation conditions. This reduces both current flowing through the winding and generated magnetomotive force, thus magnetic field strength is also decreased. Hydraulic power of the solenoid operated valve is also decreased in an appropriate manner.

Protection of Control Electronics

A coil is an inductive load in an electrical circuit. Any change in the current flowing through a coil (e.g. when switching off the coil circuit), voltage is induced according to Lenz's law and opposes the change that produced it. This poses a damage risk to the control electronics. Especially for proportional valves, it is appropriate to use a coil with an integrated quenching diode - or transient-voltage-suppression diode (e.g. Transil). Transil is a proven and reliable semiconductor element connected in parallel to the coil. If the threshold voltage is exceeded, electric current starts to flow through it, thereby converting overvoltage energy to heat.

Quick disconnect

Induced voltage originating from a quick disconnect of the coil has according to Lenz's law a negative effect on OFF switching time regarding the solenoid armature. Special electronic circuit suppresses this unwanted phenomenon.



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Контакты:

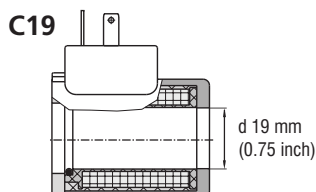
Тел./факс: (017) 346-80-64

Моб. Velcom: (029) 102-14-14

Coil sizes

Coil size	Diameter d [mm (inch)]	Valve size	Directional valves with housing		Cartridge valves		Proportional valves	
			High performance	Lightline	High performance	Lightline	Directional valves	Pressure
C14	13.4 (0.53)	Dn 03	RPEK1-03	RPEL1-04		SD2E-Ax/L SD3E-A2/L		SP4P1-B4
C19	19.0 (0.75)	Dn 04	RPE2-04 RPE3-04 SR4E2-B2	RPEL1-06	SD2E-Ax/H SD3E-A2/H SD1E-A2 SD1E-A3 ROE3	SD2E-Bx/L SD3E-B2/L	PRM2-04 PRM7-04	SR1P2-A2 SRN1P1-A2 SR4P2-B2 SRN4P1-B2 SP4P2-B3 SPN4P1-B3 PVRM1-063
C22	22.0 (0.87)	Dn 06	RPE3-06 RPEA3-06 RPEW4-06		SD2E-Bx/H SD3E-B2/H		PRM2-06 PRM7-06 PRM8-06	PVRM3-10
C31	31.0 (1.22)	Dn 10	RPE4-10 RPEW4-10				PRM6-10 PRM7-10	

Example:



For different sizes and versions of the valves, the appropriate coil sizes are used. Size designation corresponds approximately to the inner diameter of the coil.

Connector Types

Basic connectors used to connect the power supply of the coils:

- › Connector EN 175301-803-A (IP65)
- › Connector AMP JUNIOR TIMER (IP67)
- › Connector DEUTSCH DT04-2P (IP67 / IP69K)
- › Special 2-pin connector EW designed to be slipped into the wirebox
- › Loose conductors of standard length 300 mm (11.8 in)
- › Loose conductors equipped with the connector at the end

Other connector types available upon agreement with the manufacturer.



EN 175301-803-A



AMP JUNIOR TIMER



DEUTSCH DT04-2P



Connector EW

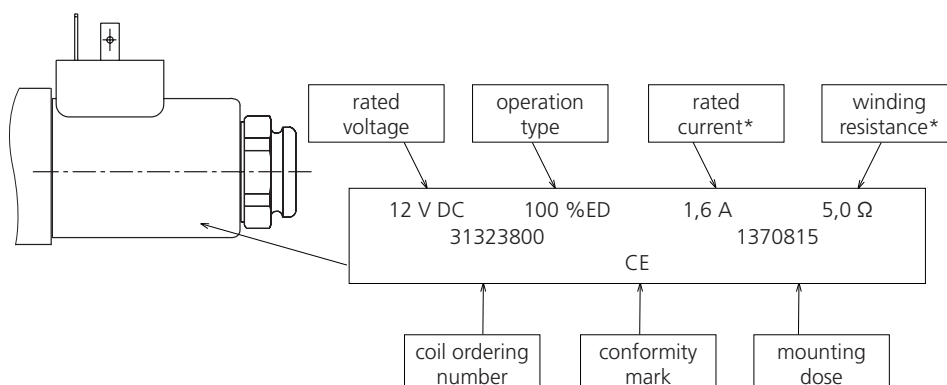


Loose Conductors

Identification of Coils

The CE conformity mark placed on the coil steel housing indicates that the product is in accordance with the following directives:

- › 2014/30/ES for electromagnetic compatibility
- › 2014/35/ES for low voltage equipment with rated voltage higher than 50 VAC and 75 VDC, respectively.



*Winding resistance is given only for coils used in proportional solenoids. Limit (maximum) current, which is allowed to flow continuously through the coil winding, is also stated for these coils instead of rated current.



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Ordering Code

Solenoid coil		Special coil design	
Coil size		no designation	Coil for
inner diameter of coil		P	switching valves
Ø 13.4 mm (0.53 in)	14		proportional valves
Ø 19.0 mm (0.75 in)	19		
Ø 22.0 mm (0.87 in)	22		
Ø 31.0 mm (1.22 in)	31		
Coil housing design version		no designation	Type of insulating material
cold rolled housing	A	H	standard
drawn housing	B		for valves with CSA certification
long drawn housing	C		
Rated voltage (on the coil terminals)		A	Housing surface treatment
12 V DC	01200	B	zinc coated, 240 h salt spray test acc. to ISO 9227
14 V DC	01400		zinc coated, 520 h salt spray test acc. to ISO 9227
24 V DC	02400		
27 V DC	02700		
48 V DC	04800		
106 V DC	10600		
205 V DC	20500		
115 V AC 50 Hz	11550		
120 V AC 60 Hz	12060		
230 V AC 50 Hz	23050		
Connector type		N	Coil detent type (for type C31 only)
see the table		B	without detent
			with detent (by pin)
			Electrical winding resistance [Ω] at 20 °C (68 °F)
			300
			xxx
			Length of loose conductors
			standard length 300 mm (11.8 in)
			other length in mm (in)
			Additional protection of conductors (only for loose conductors)
			non-braided
			braided

Not all possible combinations of parameters are produced as actual coils. If the required coil is not included in the table of the standard types, please contact our technical department to verify feasibility and identification of the specific type.

Note explaining usage of coils:

Coils with supply voltage 106 V DC are intended for rectified supply voltage 120V AC / 60 Hz.

Coils with supply voltage 205 V DC are intended for rectified supply voltage 230 V AC / 60 Hz.

Coils 115 V AC / 50 Hz have a built-in rectifier and can be also used for supply voltage 120 V AC / 50 Hz or 60 Hz.

Coils 230 V AC / 50 Hz have a built-in rectifier.

Overview of connector types and electrical connections of coils

Connector	Designation	Description
EN 175301-803-A	E1	Connector EN 175301-803-A
	E2	Connector EN 175301-803-A + quenching diode
	E5	Connector EN 175301-803-A + integrated rectifier
	E51	Connector EN 175301-803-A + integrated rectifier + quick disconnect
AMP Junior Timer	E3	Connector AMP Junior Timer (2 pins)
	E4	Connector AMP Junior Timer (2 pins) + quenching diode
AMP Junior Timer axially oriented	E3A	Axial connector AMP Junior Timer (2 pins)
	E4A	Axial connector AMP Junior Timer (2 pins) + quenching diode
Deutsch DT04-2P axially oriented	E12A	Axial connector Deutsch DT04-2P (2 pins)
	E13A	Axial connector Deutsch DT04-2P (2 pins) + quenching diode
Loose conductors	E8	Loose conductors
	E9	Loose conductors + quenching diode
Loose conductors with connector	E10	Loose conductors with connector DT04-2P (2 pins)
	E11	Loose conductors with connector DT04-2P (2 pins) + quenching diode
	E16	Loose conductors with Metri-Pack connector, series 150 (2 pins)
	E17	Loose conductors with Metri-Pack connector, series 150 (2 pins) + quenching diode
	E18	Loose conductors with Weather-Pack connector (2 pins)
	E19	Loose conductors with Weather-Pack connector (2 pins) + quenching diode
	E20	Loose conductors with Weather-Pack connector (2 jacks)
	E21	Loose conductors with Weather-Pack connector (2 jacks) + quenching diode
	E22	Loose conductors with Econoseal connector (2 pins)
	E23	Loose conductors with Econoseal connector (2 pins) + quenching diode
	E24	Loose conductors with connector DT04-2P (2 pins)
	E25	Loose conductors with connector DT04-2P (2 pins) + quenching diode
	Special connector for wirebox	EW1
EW2		Special connector for wirebox + quenching diode


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Coils C14B (d = 13.4 mm (0.53 inch))

RPEK1-03, RPEL1-04	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
SD2E-A2/L, SD2E-A3/L, SD2E-A4/L, SD3E-A2/L	→	-30...+50 (-22...+122)	-30...+80 (-22...+176)	± 10
		-20...+50 (-4...+122)	-20...+60 (-4...+122)	± 10

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E2	E3A	E4A	E12A	E13A
12 DC	1.83	16210300	C14B-01200E1-6.55NA	24101600	28822500	28822600	29268200	29268800
14 DC	1.57	24102200	C14B-01400E1-8.91NA	on request	on request	on request	34948600	on request
24 DC	0.92	16210400	C14B-02400E1-26.2NA	24101800	28686400	28822400	29268900	29269000
27 DC	0.80	33565000	C14B-02700E1-33.6NA	on request	34319700	on request	on request	on request

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E2	E3A	E4A	E12A	E13A
12 DC	1.83	on request	on request	on request	on request	on request	32700900	on request
14 DC	1.57	on request	on request	on request	on request	on request	34440200	on request
24 DC	0.92	on request	on request	on request	on request	on request	31145400	31145500

SP4P1-B4

Ambient temperature °C (°F)	Fluid temperature °C (°F)
-30...+90 (-22...+194)	-30...+90 (-22...+194)

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A
12 DC	max 0.7	on request	on request	33038300	32482500
24 DC	max 0.35	34056200	C14B-02400E1-29.5NAP	C14B-01200E3A-7.8NAP	C14B-01200E12A-7.8NAP
				33038400	32482400
				C14B-02400E3A-29.5NAP	C14B-02400E12A-29.5NAP

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A
24 DC	max 0.35	on request	on request	on request	34186400
					C14B-02400E12A-29.5NBP



Coils C19 (d = 19 mm (0.75 inch))

RPE2-04, RPE3-04, RPE1-06, ROE3-04, ROE3-06, SR4E-B2	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
SD2E-B2/L, SD2E-B3/L, SD2E-B4/L, SD3E-B2/L	→	-30...+50 (-22...+122)	-30...+80 (-22...+176)	± 10
SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3	→	-20...+50 (-4...+122)	-20...+60 (-4...+122)	± 10
	→	-20...+50 (-4...+122)	-20...+80 (-4...+176)	± 10
		-20...+80 (-4...+176) *		± 15 *



Remarks concerning Coil Usage

- For valves SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3 coils of two different power classes may be used, depending on operating conditions (max. environmental temperature, tolerance of the supply voltage).
- Coils of higher power listed in this table may be used for environmental temperatures between -20...+50 °C (-4...+122 °F) and supply voltage fluctuations of up to ± 10 % U_N. Additional coils for supply voltages of 14 VDC, 27 VDC, 205 VDC and 230 VAC/50 Hz may even be used for environmental temperatures between -20...+80 °C (-4...+176 °F) and supply voltage fluctuations of up to ± 15 % U_N.
- Coils of lower power listed in table on p.7 may be used for environmental temperatures between -20...+80 °C (-4...+176 °F) and supply voltage fluctuations of up to ± 15 % U_N.

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types									
		E1	E2	E3	E4	E4A	E4A	E12A	E13A	E13A	E13A
12 DC	2.45	27316600	27631400	27330200	27631600	27449600	27631900	27351400	27632000		
		C 19B-01200E1-4.9NA	C 19B-01200E2-4.9NA	C 19B-01200E3-4.9NA	C 19B-01200E4-4.9NA	C 19B-01200E3A-4.9NA	C 19B-01200E4A-4.9NA	C 19B-01200E12A-4.9NA	C 19B-01200E13A-4.9NA		
14 DC	1.70	27634100	27634200	27634300	27634400	27634500	27634600	27635000	27635100		
		C 19B-01400E1-8.23NA	C 19B-01400E2-8.23NA	C 19B-01400E3-8.23NA	C 19B-01400E4-8.23NA	C 19B-01400E3A-8.23NA	C 19B-01400E4A-8.23NA	C 19B-01400E12A-8.23NA	C 19B-01400E13A-8.23NA		
24 DC	1.15	27316700	27632400	27330300	27633200	27449700	27633400	27330500	27633500		
		C 19B-02400E1-20.8NA	C 19B-02400E2-20.8NA	C 19B-02400E3-20.8NA	C 19B-02400E4-20.8NA	C 19B-02400E3A-20.8NA	C 19B-02400E4A-20.8NA	C 19B-02400E12A-20.8NA	C 19B-02400E13A-20.8NA		
27 DC	0.89	27636100	27639400	27641600	27641700	27641800	27642100	27642400	27642500		
		C 19B-02700E1-30.4NA	C 19B-02700E2-30.4NA	C 19B-02700E3-30.4NA	C 19B-02700E4-30.4NA	C 19B-02700E3A-30.4NA	C 19B-02700E4A-30.4NA	C 19B-02700E12A-30.4NA	C 19B-02700E13A-30.4NA		
205 DC	0.12	27382401	not available	not available	not available	not available	not available	not available	not available		
		C 19B-20500E1-1653NA									
230 AC 50 Hz	0.12	E5									
		27449900									
		C 19B-23050E5-1653NA									

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types				
		E1	E2	E3A	E12A	E13A
14 DC	1.70	on request	on request	on request	33212800	on request
		C 19B-02400E1-20.8NB	C 19B-02400E2-20.8NB	C 19B-02400E3-20.8NB	C 19B-01400E12A-8.23NB	C 19B-02400E13A-20.8NB
24 DC	1.15	28829600	32092500	33559000	on request	40052200
		C 19B-02400E1-20.8NB	C 19B-02400E2-20.8NB	C 19B-02700E3A-30.4NB	on request	C 19B-02700E13A-30.4NB
27 DC	0.89	on request	on request	on request	on request	on request
		C 19B-02700E1-20.8NB	C 19B-02700E2-30.4NB	C 19B-02700E3-30.4NB	C 19B-02700E4A-30.4NB	C 19B-02700E13A-30.4NB



Coils C19 (d = 19 mm (0.75 inch))

RPE3-04 with CSA certification		
Surface treatment A: 240 h salt spray test acc. to ISO 9227		
Voltage [V]	Current [A]	Connector types
12 DC	2.41	E1 E5 24140700 C19A-01200E1-4.98NAH not available
24 DC	1.15	24140800 C19A-02400E1-21NAH not available
115 AC 50 Hz	0.24	24140900 C19A-11550E5-433NAH
230 AC 50 Hz	0.12	24141000 C19A-23050E5-1653NAH

SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3, SR4E-B2		
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Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
-20...+80 (-4...+176)	-20...+80 (-4...+176)	± 15

→

Surface treatment A: 240 h salt spray test acc. to ISO 9227		
Voltage [V]	Current [A]	Connector types
12 DC	2.00	E2 E3 E4 27669700 C19B-01200E1-6NA 27669900 C19B-01200E2-6NA 27670000 C19B-01200E3-6NA 27670800 C19B-02400E2-25.75NA 27670700 C19B-02400E3-25.75NA
24 DC	0.93	E1 E2 E3 E4 E12A E13A 27670600 C19B-02400E1-25.75NA 27670900 C19B-02400E4-25.75NA 30117800 C19B-02400E4A-25.75NA 32829300 C19B-01200E12A-6NA 32801600 C19B-01200E13A-6NA 31330000 C19B-02400E13A-25.75NA

Surface treatment B: 520 h salt spray test acc. to ISO 9227		
Voltage [V]	Current [A]	Connector types
24 DC	0.93	E1 E3 30449100 C19B-02400E1-25.75NB 33090800 C19B-02400E3-25.75NB



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Coils C19 (d = 19 mm (0.75 inch))

Ambient temperature °C (°F)	Fluid temperature °C (°F)
+50 (+176)	-30...+80 (-22...+176)



PRM2-04, PRM7-04

PRM2-04 proportional directional control valves without integrated electronic unit

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types			
		E1	E2	E3	E4
12 DC	max. 1.7	27821900	on request	27822000	E12A
		C19B-01200E1-4.68NAP		C19B-01200E3-4.68NAP	27821200
24 DC	max 0.8	27824200	27824300	28145200	on request
		C19B-02400E1-20.6NAP	C19B-02400E2-20.6NAP	C19B-02400E3-20.6NAP	27824400
					E13A
					on request
					29868600
					C19B-02400E13A-20.6NAP

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage		Connector types	
[V]	[A]	E3	E12A
24 DC	max 0.8	31805200	31805300
		C19B-02400E3-20.6NBP	C19B-02400E12A-20.6NBP

PRM2-04, PRM7-04 proportional directional control valves with integrated electronic unit

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage		Connector types	
[V]	[A]	E1	
12 DC	max. 1.7	16186100	
		C19A-01200E1-4.98NAP	
24 DC	max 0.8	16186200	
		C19A-02400E1-21NAP	

Ambient temperature °C (°F)	Fluid temperature °C (°F)
-20...+80 (-4...+176)	-20...+120 (-4...+248)



SR1P2-A2, SRN1P1-A2, SR4P2-B2, SRN4P1-B2, SP4P2-B3, SPN4P1-B3

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types			
		E1	E2	E3	E4
12 DC	max. 1	28145500	28145600	28145700	28145800
		C19B-01200E1-6.5NAP	C19B-01200E2-6.5NAP	C19B-01200E3-6.5NAP	C19B-02400E4-6.5NAP
24 DC	max 0.6	27824200	27824300	28145200	27824400
		C19B-02400E1-20.6NAP	C19B-02400E2-20.6NAP	C19B-02400E3-20.6NAP	C19B-02400E4-20.6NAP
					E12A
					29867600
					C19B-02400E13A-6.5NAP
					29868600
					C19B-02400E13A-20.6NAP

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage		Connector types	
[V]	[A]	E3	E12A
24 DC	max 0.6	31805200	31805300
		C19B-02400E3-20.6NBP	C19B-02400E12A-20.6NBP



Coils C19 (d = 19 mm (0.75 inch))

→	Ambient temperature °C (°F) -30...+90 (-22...+194)	Fluid temperature °C (°F) -30...+90 (-22...+194)
---	---	---

PVRM1-063

Max. reduced pressure 20 bar (290 PSI)	
Surface treatment A: 240 h salt spray test acc. to ISO 9227	
Voltage	Connector types
[V]	E12A
12 DC	max. 1
	27821300
	C19B-01200E13A-6.85NAP

Max. reduced pressure 32 bar (470 PSI)	
Surface treatment A: 240 h salt spray test acc. to ISO 9227	
Voltage	Connector types
[V]	E4 E13A
12 DC	max. 1.5
	27785600
	C19B-01200E4-4.68NAP
	C19B-01200E13A-4.68NAP

Max. reduced pressure 20 and 32 bar (290 and 470 PSI)	
Surface treatment A: 240 h salt spray test acc. to ISO 9227	
Voltage	Connector types
[V]	E1 E2 E3
24 DC	max 0.75
	27824200
	C19B-02400E1-20.6NAP
	C19B-02400E2-20.6NAP
	C19B-02400E3-20.6NAP
	C19B-02400E3A-20.6NAP
	C19B-02400E4-20.6NAP
	C19B-02400E12A-20.6NAP
	C19B-02400E13A-20.6NAP

Max. reduced pressure 20 and 32 bar (290 and 470 PSI)	
Surface treatment B: 520 h salt spray test acc. to ISO 9227	
Voltage	Connector types
[V]	E3 E12A
24 DC	max 0.75
	31805200
	C19B-02400E3-20.6NBP
	C19B-02400E12A-20.6NBP



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Coils C22 (d = 22 mm (0.87 inch))

RPE3-06, RPEA3-06, RPEW4-06	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H	→	-30...+50 (-22...+122)	-30...+80 (-22...+176)	± 10
		-20...+50 (-4...+122)	-20...+80 (-4...+176)	± 10

Remarks concerning Coil Usage

For valves SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H coils of two different power classes may be used, depending on operating conditions (max. environmental temperature, tolerance of the supply voltage).

- › Coils of higher power listed in this table may be used for environmental temperatures between -20...+50 °C (-4...+122 °F) and supply voltage fluctuations of up to ± 10 % U_N.
- › Coils of lower power listed in table on p. 12 may be used for environmental temperatures between -20...+80 °C (-4...+176 °F) and supply voltage fluctuations of up to ± 15 % U_N.

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types						
		E1	E2	E3A	E4A	E5	E12A	E13A
12 DC	2.72	16211400	24156100	24159600	24159700	E5	E12A	E13A
		C22B-01200E1-4.41NA	C22B-01200E2-4.41NA	C22B-01200E3A-4.41NA	C22B-01200E4A-4.41NA	not available	24930801	19695100
14 DC	2.14	24158200	24930900	27662100	27662200	not available	27663000	27663100
		C22B-01400E1-6.55NA	C22B-01400E2-6.55NA	C22B-01400E3A-6.55NA	C22B-01400E4A-6.55NA	not available	C22B-01400E12A-6.55NA	C22B-01400E13A-6.55NA
24 DC	1.29	16211600	24157400	24159800	24159900	not available	19695900	19696000
		C22B-02400E1-18.6NA	C22B-02400E2-18.6NA	C22B-02400E3A-18.6NA	C22B-02400E4A-18.6NA	not available	C22B-02400E12A-18.6NA	C22B-02400E13A-18.6NA
27 DC	1.07	16211700	24157600	19744600	19744500	not available	27663200	27663300
		C22B-02700E1-25.3NA	C22B-02700E2-25.3NA	C22B-02700E3A-25.3NA	C22B-02700E4A-25.3NA	not available	C22B-02700E12A-25.3NA	C22B-02700E13A-25.3NA
205 DC	0.15	16211500	not available	not available	not available	not available	not available	not available
		C22B-20500E1-1400NA						
230 AC 50 Hz	0.15	not available	not available	not available	not available	18849000	not available	not available
						C22B-23050E5-1400NA		

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types						
		E1	E2	E3A	E4A	E5	E12A	E13A
12 DC	2.72	34007700	32489000	on request	on request	not available	31536900	E13A
		C22B-01200E1-4.41NB	C22B-01200E2-4.41NB	on request	on request	not available	C22B-01200E12A-4.41NB	on request
24 DC	1.29	24156800	32092900	24160200	24160300	not available	31156300	33089500
		C22B-02400E1-18.6NB	C22B-02400E2-18.6NB	C22B-02400E3A-18.6NB	C22B-02400E4A-18.6NB	not available	C22B-02400E12A-18.6NB	C22B-02400E13A-18.6NB
27 DC	1.07	33570600	on request	31802800	on request	not available	31802900	on request
		C22B-02700E1-25.3NB	on request	C22B-02700E3A-25.3NB	on request	not available	C22B-02700E12A-25.3NB	on request

RPEA3-06

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	
		E1	EW1
24 DC	0.33	24157700	24014000
		C22B-02400E1-72NA	C22C-02400EW1-72NAM



Coils C22 (d = 22 mm (0.87 inch))

RPEW4-06		
Surface treatment A: 240 h salt spray test acc. to ISO 9227		
Voltage [V]	Current [A]	Connector types
12 DC	2.64	EW1 16205100 C22C-01200EW1-4.54NA/M
24 DC	1.32	EW2 16205400 C22C-01200EW2-4.54NA/M
		16205500 C22C-02400EW1-18.2NA/M
		C22C-02400EW2-18.2NA/M

RPE3-06 with CSA certification		
Surface treatment A: 240 h salt spray test acc. to ISO 9227		
Voltage [V]	Current [A]	Connector types
12 DC	2.72	E1 24154300 C22A-01200E1-4.41NAH
24 DC	1.29	E5 24154400 C22A-02400E1-18.6NAH
115 AC 50 Hz	0.30	not available 24154500 C22A-11550E5-344NAH
230 AC 50 Hz	0.15	not available 24154600 C22A-23050E5-1393NAH

RPEW4-06 with CSA certification		
Surface treatment A: 240 h salt spray test acc. to ISO 9227		
Voltage [V]	Current [A]	Connector types
12 DC	2.64	EW1 24154700 C22C-01200EW1-4.54NAH/M
24 DC	1.32	EW2 24155500 C22C-01200EW2-4.54NAH/M
106 DC	0.27	24154900 C22C-02400EW1-18.2NAH/M
		24155300 C22C-02400EW2-18.2NAH/M
		24155100 C22C-10600EW1-400NAH/M
		not available



Coils C22 (d = 22 mm (0.87 inch))

SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H	→	Ambient temperature °C (°F) -20...+80 (-4...+176)	Fluid temperature °C (°F) -20...+80 (-4...+176)	Supply voltage tolerance % of U _N ± 15
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Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E2	E3A	E4A	E5	E12A	E13A
12 DC	1.83	27222400	27222500	27222600	27222700	not available	18815601	19909000
		C22B-01200E1-6.55NA	C22B-01200E2-6.55NA	C22B-01200E3A-6.55NA	C22B-01200E4A-6.55NA	not available	C22B-01200E12A-6.55NA	C22B-01200E13A-6.55NA
24 DC	0.95	27222800	27222900	27223000	27223100	not available	19909101	19909200
		C22B-02400E1-25.3NA	C22B-02400E2-25.3NA	C22B-02400E3A-25.3NA	C22B-02400E4A-25.3NA	not available	C22B-02400E12A-25.3NA	C22B-02400E13A-25.3NA
205 DC	0.09	24160100	not available	not available	not available	not available	not available	not available
		C22B-20500E1-2353NA						
230 AC 50 Hz	0.09	not available	not available	not available	not available	20004200	not available	not available
						C22B-23050E5-2353NA		

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E13A
24 DC	0.95	30129500	33028000
		C22B-02400E1-25.3NB	C22B-02400E13A-25.3NB

PRM2-06, PRM7-06, PRM8-06

Ambient temperature °C (°F) +50 (+176)	Fluid temperature °C (°F) -30...+80 (-22...+176)
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PRM2-06 proportional directional control valves with integrated electronic unit

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A	E13A
12 DC	max 1.6	16187500	16187500	19744700	19696100	19909300
		C22A-01200E1-5.15NAP		C22B-01200E3A-2.33NAP	C22B-01200E12A-2.33NAP	C22B-01200E13A-2.33NAP
24 DC	max 1	16186800	16186800	19744300	19696200	30691600
		C22A-02400E1-13.4NAP		C22B-02400E1-13.4NAP	C22B-02400E12A-13.4NAP	C22B-02400E13A-13.4NAP

PRM2-06 proportional directional control valves without integrated electronic unit

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A	E13A
12 DC	max 2.5	18838500	18838500	19744700	19696100	19909300
		C22B-01200E1-2.33NAP		C22B-01200E3A-2.33NAP	C22B-01200E12A-2.33NAP	C22B-01200E13A-2.33NAP
24 DC	max 1	18838300	18838300	19744300	19696200	30691600
		C22B-02400E1-13.4NAP		C22B-02400E3A-13.4NAP	C22B-02400E12A-13.4NAP	C22B-02400E13A-13.4NAP



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Coils C22 (d = 22 mm (0.87 inch))

PRM2-06 proportional directional control valves without integrated electronic unit
Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A	E13A
12 DC	max 2.5	C22B-01200E1-2.33NBP	34180800	on request	on request	on request
24 DC	max 1	C22B-02400E1-13.4NBP	34184200	33288400	on request	28811200
				C22B-02400E3A-13.4NBP		C22B-02400E13A-13.4NBP

PRM7-06, PRM8-06 proportional directional control valves without integrated electronic unit
Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A	E13A
12 DC	max 2.5	C22B-01200E1-2.33NBP	18838500	19744700	19696100	19909300
24 DC	max 1	C22B-02400E1-13.4NBP	18838300	19744300	19696200	30691600
				C22B-02400E3A-13.4NBP	C22B-02400E12A-13.4NBP	C22B-02400E13A-13.4NBP

PRM7-06, PRM8-06 proportional directional control valves without integrated electronic unit
Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A	E12A	E13A
12 DC	max 2.5	C22B-01200E1-2.33NBP	34180800	on request	on request	on request
24 DC	max 1	C22B-02400E1-13.4NBP	34184200	33288400	on request	28811200
				C22B-02400E3A-13.4NBP		C22B-02400E13A-13.4NBP

PVRM3-10	Ambient temperature °C (°F)	Fluid temperature °C (°F)
	-30...+90 (-22...+194)	-30...+90 (-22...+194)

PVRM3-10	Ambient temperature °C (°F)	Fluid temperature °C (°F)
	-30...+90 (-22...+194)	-30...+90 (-22...+194)

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A
12 DC	max 1.5	C22B-01200E3A-5NAP	24157900	
24 DC	max 1	C22B-02400E3A-13.4NBP	19744300	

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	E1	E3A
12 DC	max 1.5	C22B-01200E3A-5NAP	24157900	
24 DC	max 1	C22B-02400E3A-13.4NBP	19744300	



Coils C31 (d = 31 mm (1.22 inch))

→	Ambient temperature °C (°F) -30...+50 (-22...+122)	Fluid temperature °C (°F) -30...+80 (-22...+176)	Supply voltage tolerance % of U _N ± 10
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RPE4-10							
Surface treatment A: 240 h salt spray test acc. to ISO 9227							
Voltage [V]	Current [A]	Connector types	E1	E2	E3	E4	E5
12 DC	3.17	C31A-01200E1-3.78FA	16195700	27660800	16197000	16196900	E12A
			C31A-01200E1-3.78FA	C31A-01200E2-3.78FA	C31A-01200E3-3.78FA	C31A-01200E4-3.78FA	33252200 C31A-01200E12A-3.78FA
14 DC	2.98	C31A-01400E1-4.73FA	16195900	27660900	27661100	27661200	on request
			C31A-01400E1-4.73FA	C31A-01400E2-4.73FA	C31A-01400E3-4.73FA	C31A-01400E4-4.73FA	on request
24 DC	1.73	C31A-02400E1-13.9FA	16196100	23896000	16197200	16197100	33252300
			C31A-02400E1-13.9FA	C31A-02400E2-13.9FA	C31A-02400E3-13.9FA	C31A-02400E4-13.9FA	C31A-02400E12A-13.9FA
27 DC	1.52	C31A-02700E1-17.8FA	16196300	27661000	27661300	27661400	on request
			C31A-02700E1-17.8FA	C31A-02700E2-17.8FA	C31A-02700E3-17.8FA	C31A-02700E4-17.8FA	33863900 C31A-02700E13A-17.8FA
205 DC	0.20	C31A-20500E1-1027FA	not available	not available	not available	not available	not available
			not available	not available	not available	not available	not available
230 AC 50 Hz	0.20	not available	not available	not available	not available	not available	16195100
			not available	not available	not available	not available	C31A-23050E5-1027FA

RPE4-10							
Surface treatment B: 520 h salt spray test acc. to ISO 9227							
Voltage [V]	Current [A]	Connector types	E3	E4	E5	E12A	
24 DC	1.73	C31A-02400E3-13.9FB	29427900	33081100	not available	33267000	
			C31A-02400E3-13.9FB	C31A-02400E4-13.9FB	C31A-02400E12A-13.9FB	on request	on request
27 DC	1.52	C31A-02700E3-17.8FB	31803100	not available	not available	not available	
			C31A-02700E3-17.8FB	not available	not available	not available	
230 AC 50 Hz	0.20	not available	not available	not available	not available	not available	
			not available	not available	not available	31884600	



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Coils C31 (d = 31 mm (1.22 inch))

RPEW4-10 (Wire box)

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types
12 DC	3.17	24172000 C31A-01200EW1-3.78FAM
24 DC	1.73	24172200 C31A-02400EW1-13.9FAM
106 DC	0.38	24172400 C31A-10600EW1-276FAM

RPE4-10 with CSA certification

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types
12 DC	0.38	24172800 C31A-12060E5-276FAH

RPEW4-10 with CSA certification

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types
120 AC 60 Hz	0.38	24172600 C31A-10600EW1-276FAH/M

PRM6-10, PRM7-10

Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types
12 DC	max 1.9	E1 16195800 C31A-01200E1-4.73FAP
24 DC	max 1.1	E3 33223900 C31A-01200E3-4.73FAP
		E12A 33252400 C31A-01200E12A-4.73FAP
		31354800 C31A-02400E3-13.9FAP
		33251800 C31A-02400E12A-13.9FAP

Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types
24 DC	max 1.1	E1 33461500 C31A-02400E1-13.9FBP

Ambient temperature °C (°F)	Fluid temperature °C (°F)
+50 (+122)	-30...+80 (-22...+176)



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C14B					
E1, E2	IP65	E3A, E4A	IP67	E12A, E13A	IP67 / IP69K
C19A					
E1, E2	IP65	E5	IP65		
C19B					
E1, E2	IP65	E5, E51	IP65	E3, E4	IP67
E3A, E4A	IP67	E12A, E13A	IP67 / IP69K	E8, E9	
C22A					
E1, E2	IP65	E5	IP65		

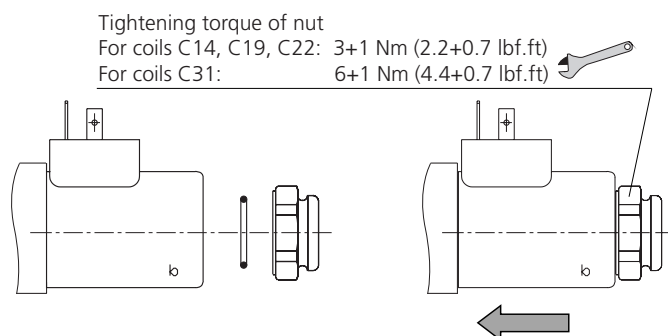


Dimensions in millimeters (inch)

C22B		
E1, E2 IP65	E5, E51 IP65	E3A, E4A IP67
E12A, E13A IP67 / IP69K	E8, E9	
C22C		
EW1, EW2 IP65		
C31A		
E1, E2 IP65	E5, E51 IP65	E3, E4 IP67
E12A, E13A IP67 / IP69K	E8, E9	EW1 IP65



Mounting / dismantling the coils



- › Choose the correct coil type according to the valve type given in this data sheet HA 8007. When AC power supply is chosen, the connector with integrated rectifier or the connector plug with integrated rectifier must be used.
- › The coil is placed on the solenoid actuating system (as indicated in the picture) and its position is fixed by a nut. The nut must be tightened with the specified torque.
- › The connector position can be set by rotating the coil around its longitudinal axis - continuously in the range of 0 - 360° / by 90° for coils with a locating pin.



CAUTION

- › Coil mounting, especially the connection to power supply, must be carried out by a competent person only.



WARNING

- › Before any handling the coil must be disconnected from the power supply.
- › The hydraulic circuit must be switched off and unloaded during installation.
- › Disconnect the coil from the power supply before dismantling and let it cool down to avoid burns. The temperature may exceed 100 °C (212 °F) during operation.

Operation

Basic operating parameters are stated in the data sheet of the relevant solenoid operated valve and the coil description is given in the data sheet HA 8007.



CAUTION

- › Power supply parameters must correspond to the specified coil type. Switching coils are controlled by voltage. The voltage indicated on the coil is the nominal voltage. Control voltage should not deviate from nominal by more than ±10 %, if not stated otherwise in the data sheet. Proportional coils are controlled by current. The current indicated on the coil is the limit (maximum) current which may continuously flow through the coil winding.
- › The coil may be energized only if correctly placed on the solenoid actuating system and properly fixed by a nut.
- › If a valve is operated by two solenoids acting in the opposite directions, the two solenoids must never be energized simultaneously.
- › Protect the coil against the effects of high temperatures and thermal shocks. The operating temperature range of hydraulic fluid and maximum ambient temperature are stated in the data sheet of the given valve. In general, there must be a sufficient heat removal from the coil so that the mean winding temperature does not exceed 155 °C (311 °F).
- › Protect the coil against peak voltages by a suitable overvoltage protection.
- › Protect the coil against mechanical damage, excessive vibrations and shocks.
- › Protect the coil against effects of a corrosive environment and aggressive chemicals.
- › The coil is not designed for operation immersed in fluid.



WARNING - notices regarding the residual risks

- › Damaged coils, coils with damaged parts of the power supply connector or a damaged cable must be taken out of operation immediately. There is a possibility of electric shock.
- › Don't touch the coil surface during operation. The coil becomes warm and there is a risk of burns.



Applicability of legal regulations

The following requirements apply to the coils:

- › Directive 2014/30/EU for electromagnetic compatibility of electrical equipment
- › Directive 2014/35/EU for low voltage equipment with rated voltage higher than 75 V DC and 50 V AC, respectively.

Coils are designated by the CE conformity mark and they are delivered with instructions. The declaration of conformity is issued for each item.

Tests of coils according to the CSA standard are carried out together with the hydraulic part. The certification covers the complete directional control valves.

