

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	V	see Ordering code			
Allowable voltage fluctuation		$U_N \pm 10 \%$, if not stated otherwise in the valve datasheet			
Nominal and max. current	A	see the table of coil types			
Winding resistance at 20 °C*	Ω	see the table of coil types			
Input power of coil at 20 °C	W	by calculation $P = U^2 / R$			
Max. ambient temperature	°C (°F)	50 (122), if not stated otherwise in the datasheet			
Operation conditions		see the datasheets of individual types of valves			
Max. winding temperature	°C (°F)	155 (311)			
Approximate weight of the coils	Coil size	C 14	C 19	C 22	C 31
	kg (lbs)	0.13 (0.29)	0.22 (0.48)	0.35 (0.77)	0.96 (2.12)
	Datasheet	Type			
General information	GI_0060	products and general conditions			
Connectors	K_8008	connectors EN 175301-803-A			

* The nominal resistance R20 (measured at 20 °C) of the coil winding may fluctuate within $\pm 7 \%$ of the nominal value due to used coil winding technology.

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

Nominal voltages and nominal resistances (resistance value at 20°C) are listed in the coil ordering codes. Nominal currents (coils for switching valves) and maximum permissible currents (coils for proportional valves) are listed in the type table. The coils are designed for DC power supply. For AC supply, a coil with built-in rectifier or a plug-in rectifier must be used.



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

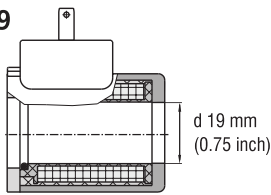
Induced voltage originating from a quick disconnect of the coil has according to Lenz's law a negative effect on OFF switching time regarding the solenoid armature. Special electronic circuit suppresses this unwanted phenomenon.

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		SD3P-A2/H SP4P1-B4
C19	19.0 (0.75)	Dn 04	RPE2-04 RPE3-04	RPEL2-06	SD2E-Ax/H SD3E-A2/H SD1E-A2 SD1E-A3 ROE3 SR1E2-A2 SR4E2-B2 SR4E2-C2 SP4E1-B3		SD2E-B*/L SD3E-B2/L	PRM2-04 PRM7-04	SD3P-B2/H SR1P2-A2 SRN1P1-A2 SR4P2-B2 SRN4P1-B2 SP4P2-B3 SPN4P1-B3 PVRM1-063
C22	22.0 (0.87)	Dn 06	RPE3-06 RPEW4-06 RPER3-06	RPEL1-10	SD2E-B*/H SD3E-B2/H SD3E-C2/H			PRM2-06 PRMR2-06 PRM7-06 PRM8-06	SD2P-B4/H SF32P-C3/H PVRM3-10
C31	31.0 (1.22)	Dn 10	RPE4-10 RPEW4-10					PRM6-10 PRM7-10	

Example:

C19



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



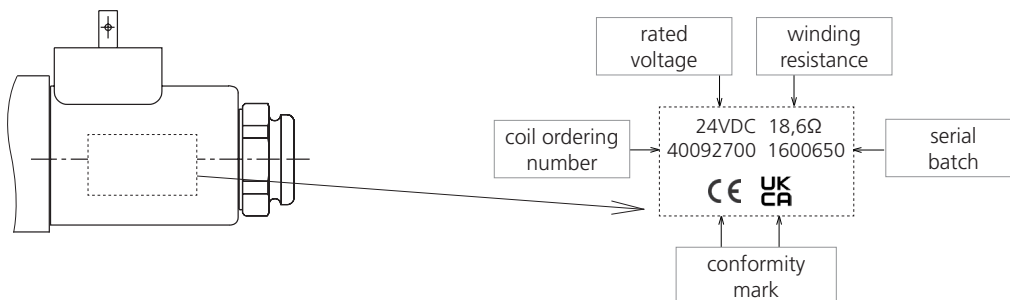
Connector EW



Loose Conductors

Identification of Coils

The **CE** and **UK CA** conformity mark placed on the coil steel housing indicates that the product is in accordance with the European directives and the relevant UK requirements.



Example of coil description:
Type sticker information can differ due to huge variety of coil designs.

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Ordering Code

C [] [] - [] [] [] [] - [] [] [] [] /M	
Solenoid coil	Special coil design
Coil size inner diameter of coil Ø 13.4 mm (0.53 in) 14 Ø 19.0 mm (0.75 in) 19 Ø 22.0 mm (0.87 in) 22 Ø 31.0 mm (1.22 in) 31	Type of insulating material no designation H standard for valves with CSA certification
Coil housing design version cold rolled housing A drawn housing B long drawn housing C	Housing surface treatment A zinc coated, 240 h salt spray test acc. to ISO 9227 B zinc coated, 520 h salt spray test acc. to ISO 9227
Rated voltage (on the coil terminals) 12 V DC 01200 14 V DC 01400 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	Coil detent type (for type C31 only) N without detent F with detent (by pin)
Connector type see the table	Electrical winding resistance [Ω] at 20 °C (68 °F) ± 7 % 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) N non-braided B 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 21 V DC are intended for rectified supply voltage 24 V AC / 50 Hz.
- Coils with supply voltage 106 V DC are intended for rectified supply voltage 120 V AC / 60 Hz.
- Coils with supply voltage 205 V DC are intended for rectified supply voltage 230 V AC / 50 Hz.
- Coils 115 V AC / 50 Hz have a built-in rectifier.
- Coils 120 V AC / 60 Hz have a built-in rectifier.
- 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 AMP Junior Timer (2 pins)
	E25	Loose conductors with connector AMP Junior Timer (2 pins) + quenching diode
	Special connector for wirebox	EW1
EW2		Special connector for wirebox + quenching diode

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

		Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
RPEK1-03, RPEL1-04	→	-30...+50 (-22...+122)	-30...+80 (-22...+176)	±10
SD2E-A2/L, SD2E-A3/L, SD2E-A4/L, SD3E-A2/L	→	-30...+50 (-22...+122)	-30...+60 (-22...+140)	±10

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

Voltage [V]	Current [A]	Connector types		
		E2	E3A	E4A
12 DC	1.83	16210300 C14B-01200E1-6.55NA	28822500 C14B-01200E3A-6.55NA	28822600 C14B-01200E4A-6.55NA
		24102200 C14B-01400E1-8.91NA	on request	40291000 C14B-01400E3A-8.91NA
24 DC	0.92	16210400 C14B-02400E1-26.2NA	28686400 C14B-02400E3A-26.2NA	28822400 C14B-02400E4A-26.2NA
		33565000 C14B-02700E1-33.6NA	on request	34319700 C14B-02700E3A-33.6NA

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

Voltage [V]	Current [A]	Connector types		
		E2	E3A	E4A
12 DC	1.83	42978200 C14B-01200E1-6.55NB	on request	32700900 C14B-01200E12A-6.55NB
		on request	on request	34440200 C14B-01400E12A-8.91NB
24 DC	0.92	33469800 C14B-02400E1-26.2NB	on request	31145400 C14B-02400E12A-26.2NB

	Ambient temperature °C (°F)	Fluid temperature °C (°F)
SP4P1-B4	→ →	→ →
	-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		
		E3A	E12A	E13A
12 DC	max. 0.7	33038300 C14B-01200E3A-7.8NA	32482500 C14B-01200E12A-7.8NA	437442 C14B-02400E13A-29.5NA
		34056200 C14B-02400E1-29.5NA	32482400 C14B-02400E12A-29.5NA	

Surface treatment B: 520 h salt spray test acc. to ISO 9227			
Voltage [V]	Current [A]	Connector types	
		E1	E3A
12 DC	max. 0.7	on request	on request
		on request	on request
24 DC	max. 0.35	on request	on request

	Ambient temperature °C (°F)	Fluid temperature °C (°F)
SD3P-A2/H	→ →	→ →
	-30...+80 (-22...+176)	-30...+80 (-22...+176)

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

Voltage [V]	Current [A]	Connector types		
		E2	E3A	E13A
12 DC	max. 0.950	42978200 C14B-01200E1-6.55NB	on request	32700900 C14B-01200E12A-6.55NB
		33469800 C14B-02400E1-26.2NB	on request	31145400 C14B-02400E13A-26.2NB

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

	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _n
→	-30...+50 (-22...+122)	-30...+60 (-22...+140)	±10
→	-30...+50 (-22...+122)	-30...+80 (-22...+176)	±10
→ limited operating conditions of the valves	-30...+50 (-22...+122)	-30...+80 (-22...+176)	±10

→	SD2E-B2/L, SD2E-B3/L, SD2E-B4/L, SD3E-B2/L
→	RPE2-04, RPE3-04, RPEL2-06, ROE3-04, ROE3-06, SR1E2-A2, SR4E2-B2, SR4E2-C2, SP4E1-B3
→	SD2E-A2/H, SD2E-A3/H, SD2E-A4/Hx, SD3E-A2/H, SD1E-A2, SD1E-A3

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

Voltage [V]	Current [A]	Connector types									
		E1	E2	E3	E4	E3A	E4A	E12A	E13A		
12 DC	2.45	27316600 C19B-01200E1-4.9NA	27631400 C19B-01200E2-4.9NA	27330200 C19B-01200E3-4.9NA	27631600 C19B-01200E4-4.9NA	27449600 C19B-01200E3A-4.9NA	27631900 C19B-01200E4A-4.9NA	27351400 C19B-01200E12A-4.9NA	27632000 C19B-01200E13A-4.9NA		
14 DC	1.70	27634100 C19B-01400E1-8.23NA	27634200 C19B-01400E2-8.23NA	27634300 C19B-01400E3-8.23NA	27634400 C19B-01400E4-8.23NA	27634500 C19B-01400E3A-8.23NA	27634600 C19B-01400E4A-8.23NA	27635000 C19B-01400E12A-8.23NA	27635100 C19B-01400E13A-8.23NA		
24 DC	1.15	27316700 C19B-02400E1-20.8NA	27632400 C19B-02400E2-20.8NA	27330300 C19B-02400E3-20.8NA	27633200 C19B-02400E4-20.8NA	27449700 C19B-02400E3A-20.8NA	27633400 C19B-02400E4A-20.8NA	27330500 C19B-02400E12A-20.8NA	27633500 C19B-02400E13A-20.8NA		
27 DC	0.89	27636100 C19B-02700E1-30.4NA	27639400 C19B-02700E2-30.4NA	27641600 C19B-02700E3-30.4NA	27641700 C19B-02700E4-30.4NA	27641800 C19B-02700E3A-30.4NA	27642100 C19B-02700E4A-30.4NA	27642400 C19B-02700E12A-30.4NA	27642500 C19B-02700E13A-30.4NA		
205 DC	0.12	27382401 C19B-20500E1-1653NA	not available	not available	not available	not available	not available	not available	not available		not available
120 AC	0.22	27642700 C19B-12060E5-494NA									
230 AC	0.12	27668600 C19B-23050E5-2065NA									

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

Voltage [V]	Current [A]	Connector types									
		E1	E2	E3	E3A	E4A	E12A	E13A			
12 DC	2.45	40134900 C19B-01200E1-4.9NB	on request	42995500 C19B-01200E3-4.9NB	on request	43486900 C19B-01200E4A-4.9NB	40317600 C19B-01200E12A-4.9NB	43930600 C19B-01200E13A-4.9NB			
14 DC	1.70	43106200 C19B-01400E1-8.23NB	on request	on request	on request	on request	33212800 C19B-01400E12A-8.23NB	on request			
24 DC	1.15	28829600 C19B-02400E1-20.8NB	on request	32092500 C19B-02400E2-20.8NB	on request	43191500 C19B-02400E3A-20.8NB	40384800 C19B-02400E4A-20.8NB	31330200 C19B-02400E12A-20.8NB	40052200 C19B-02400E13A-20.8NB		
27 DC	0.89	41167700 C19B-02700E1-30.4NB	on request	on request	33559000 C19B-02700E3A-30.4NB	on request	on request	on request	40052200 C19B-02700E13A-30.4NB		

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	24140700 C19A-01200E1-4.98NAH
24 DC	1.15	24140800 C19A-02400E1-21NAH

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

SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3, SR4E2-B2		Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
		-30...+80 (-22...+176)	-30...+80 (-22...+176)	±15

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

Voltage [V]	Current [A]	Connector types							
		E1	E2	E3	E4	E3A	E4A	E12A	E13A
12 DC	2.00	27669700 C 19B-01200E1-6NA	27669900 C 19B-01200E2-6NA	27670000 C 19B-01200E3-6NA	27670100 C 19B-01200E4-6NA	on request	on request	32829300 C 19B-01200E12A-6NA	29871300 C 19B-01200E13A-6NA
14 DC	1.70	27634100 C 19B-01400E1-8,23NA	27634200 C 19B-01400E2-8,23NA	27634300 C 19B-01400E3-8,23NA	27634400 C 19B-01400E4-8,23NA	27634500 C 19B-01400E3A-8,23NA	27634600 C 19B-01400E4A-8,23NA	27635000 C 19B-01400E12A-8,23NA	27635100 C 19B-01400E13A-8,23NA
24 DC	0.93	27670600 C 19B-02400E1-25,75NA	27670700 C 19B-02400E2-25,75NA	27670800 C 19B-02400E3-25,75NA	27670900 C 19B-02400E4-25,75NA	on request	on request	31330000 C 19B-02400E4A-25,75NA	32801600 C 19B-02400E13A-25,75NA
27 DC	0.89	27636100 C 19B-02700E1-30,4NA	27639400 C 19B-02700E2-30,4NA	27641600 C 19B-02700E3-30,4NA	27641700 C 19B-02700E4-30,4NA	27641800 C 19B-02700E3A-30,4NA	27642100 C 19B-02700E4A-30,4NA	27642400 C 19B-02700E12A-30,4NA	27642500 C 19B-02700E13A-30,4NA
205 DC	0.12	27668700 C 19B-20500E1-2065NA	not available	not available	not available	not available	not available	not available	not available

Voltage [V]	Current [A]	E5
120 AC	0.22	27642700 C 19B-12060E5-494NA
230 AC	0.12	27668600 C 19B-23050E5-2065NA

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

Voltage [V]	Current [A]	Connector types		
		E1	E2	E3
12 DC	2.00	42808800 C 19B-01200E1-6NB	43195300 C 19B-01200E2-6NB	40932800 C 19B-01200E12A-6NB
24 DC	0.93	30449100 C 19B-02400E1-25,75NB	41894800 C 19B-02400E2-25,75NB	40932900 C 19B-02400E3-25,75NB

SD3P-B2/H		Ambient temperature °C (°F)	Fluid temperature °C (°F)
		-30...+80 (-22...+176)	-30...+80 (-22...+176)

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

Voltage [V]	Current [A]	Connector types			
		E1	E2	E3	E4
12 DC	max. 1.2	40134900 C 19B-01200E1-4,9NB	on request	42999500 C 19B-01200E3-4,9NB	43486900 C 19B-01200E4A-4,9NB
24 DC	max. 0.6	28829600 C 19B-02400E1-20,8NB	32092500 C 19B-02400E2-20,8NB	44017500 C 19B-02400E3A-20,8NB	43191500 C 19B-02400E4A-20,8NB

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

PRM2-04, PRM7-04	Ambient temperature °C (°F) 30 ...+50 (-22 ...+122)	Fluid temperature °C (°F) -30 ...+80 (-22 ...+176)
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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	27785600
		C19B-01200E1-4.68NA	C19B-01200E3-4.68NA	C19B-01200E4-4.68NA	C19B-01200E4-4.68NA
24 DC	max. 0.8	27824200	27824300	28145200	27824400
		C19B-02400E1-20.6NA	C19B-02400E2-20.6NA	C19B-02400E3-20.6NA	C19B-02400E4-20.6NA
				E12A	E13A
				31688600	27821200
				C19B-01200E3A-4.68NA	C19B-01200E12A-4.68NA
				31891300	30754900
				C19B-02400E3A-20.6NA	C19B-02400E12A-20.6NA
					29868600
					C19B-02400E13A-20.6NA

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

Voltage [V]	Current [A]	Connector types		
		E2	E3	E4
24 DC	max. 0.8	40406400	43664000	42284300
		C19B-02400E1-20.6NB	C19B-02400E2-20.6NB	C19B-02400E3-20.6NB
				E12A
				31805300
				C19B-02400E12A-20.6NB
				40457400
				C19B-02400E13A-20.6NB

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 [V]	Current [A]	Connector types		
		E1	E2	E3
12 DC	max. 1.7	16186100	16191600	16191100
		C19A-01200E1-4.98NA	C19A-01200E2-4.98NA	C19A-01200E3-4.98NA
24 DC	max. 0.8	16186200	16191700	16191200
		C19A-02400E1-21NA	C19A-02400E2-21NA	C19A-02400E3-21NA
				E4
				16191300
				C19A-01200E4-4.98NA
				16191400
				C19A-02400E4-21NA

SR1P2-A2, SRN1P1-A2, SR4P2-B2, SRN4P1-B2, SP4P2-B3, SPN4P1-B3	Ambient temperature °C (°F) -30 ...+80 (-22 ...+176)	Fluid temperature °C (°F) -30 ...+120 (-22 ...+248)
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→ →

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-01200E1-6.5NA	C19B-01200E2-6.5NA	C19B-01200E3-6.5NA	C19B-01200E4-6.5NA
24 DC	max. 0.6	27824200	27824300	28145200	27824400
		C19B-02400E1-20.6NA	C19B-02400E2-20.6NA	C19B-02400E3-20.6NA	C19B-02400E4-20.6NA
				E3A	E12A
				33793600	28184900
				C19B-01200E3A-6.5NA	C19B-01200E12A-6.5NA
				31891300	30754900
				C19B-02400E3A-20.6NA	C19B-02400E12A-20.6NA
					29868600
					C19B-02400E13A-20.6 NA

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

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

Ambient temperature °C (°F)	Fluid temperature °C (°F)
-30...+80 (-22...+176)	-30...+120 (-22...+248)

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

Voltage [V]	Current [A]	Connector types	E2	E3	E3A	E12A	E13A
12 DC	max.1		40406300 C19B-01200E1-6.5NB	on request	on request	40406200 C19B-01200E12A-6.5NB	on request
24 DC	max. 0.6		40406400 C19B-02400E2-20.6NB	31805200 C19B-02400E3-20.6NB	42284300 C19B-02400E3A-20.6NB	31805300 C19B-02400E12A-20.6NB	40457400 C19B-02400E13A-20.6NB

PVRM1-063

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
12 DC	max. 1	27821300 C19B-01200E13A-6.85NA

Surface treatment A: 240 h salt spray test acc. to ISO 9227 - Max. reduced pressure 32 bar (470 PSI)

Spannung [V]	Strom [A]	Steckerarten	E3	E4	E12A	E13A
12 DC	max. 1.5		27822000 C19B-01200E3-4.68NA	27785600 C19B-01200E4-4.68NA	27821200 C19B-01200E12A-4.68NA	29869000 C19B-01200E13A-4.68NA

Surface treatment B: 520 h salt spray test acc. to ISO 9227 - Max. reduced pressure 32 bar (470 PSI)

Voltage [V]	Current [A]	Connector types	E3	E4	E12A	E13A
12 DC	max. 1.5		on request	on request	42397200 C19B-01200E12A-4.68NB	on request

Surface treatment A: 240 h salt spray test acc. to ISO 9227 - Max. reduced pressure 20 and 32 bar (290 and 470 PSI)

Voltage [V]	Current [A]	Connector types	E2	E3	E3A	E4	E12A	E13A
24 DC	max. 0.75		27824200 C19B-02400E1-20.6NA	28145200 C19B-02400E3-20.6NA	31891300 C19B-02400E3A-20.6NA	27824400 C19B-02400E4-20.6NA	30754900 C19B-02400E12A-20.6NA	29868600 C19B-02400E13A-20.6NA

Surface treatment B: 520 h salt spray test acc. to ISO 9227 - Max. reduced pressure 20 and 32 bar (290 and 470 PSI)

Voltage [V]	Current [A]	Connector types	E2	E3	E3A	E12A	E13A
24 DC	max. 0.75		43664000 C19B-02400E2-20.6NB	31805200 C19B-02400E3-20.6NB	42284300 C19B-02400E3A-20.6NB	31805300 C19B-02400E12A-20.6NB	40457400 C19B-02400E13A-20.6NB

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

		Ambient temperature °C (°F)		Fluid temperature °C (°F)		Supply voltage tolerance % of U _N	
		-30...+50 (-22...+122)		-30...+80 (-22...+176)		±10	
		-30...+50 (-22...+122)		-30...+80 (-22...+176)		±10	

→ limited operating conditions of the valves →

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	2.79	16211400 C22B-01200E1-4.3NA	24156100 C22B-01200E2-4.3NA	24159600 C22B-01200E3A-4.3NA	24159700 C22B-01200E4A-4.3NA	not available	24930801 C22B-01200E12A-4.3NA	19695100 C22B-01200E13A-4.3NA	
14 DC	2.14	24158200 C22B-01400E1-6.55NA	24930900 C22B-01400E2-6.55NA	27662100 C22B-01400E3A-6.55NA	27662200 C22B-01400E4A-6.55NA	not available	27663000 C22B-01400E12A-6.55NA	27663100 C22B-01400E13A-6.55NA	
24 DC	1.32	16211600 C22B-02400E1-18.2NA	24157400 C22B-02400E2-18.2NA	24159800 C22B-02400E3A-18.2NA	24159900 C22B-02400E4A-18.2NA	not available	19695900 C22B-02400E12A-18.2NA	19696000 C22B-02400E13A-18.2NA	
27 DC	1.07	16211700 C22B-02700E1-25.3NA	24157600 C22B-02700E2-25.3NA	19744600 C22B-02700E3A-25.3NA	19744500 C22B-02700E4A-25.3NA	not available	27663200 C22B-02700E12A-25.3NA	27663300 C22B-02700E13A-25.3NA	
205 DC	0.15	16211500 C22B-20500E1-1400NA	not available	not available	not available	not available	not available	not available	
230 AC 50 Hz	0.15	not available	not available	not available	not available	18849000 C22B-23050E5-1400NA	not available	not available	

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	2.79	34007700 C22B-01200E1-4.3NB	32489000 C22B-01200E2-4.3NB	43962500 C22B-01200E3A-4.3NB	on request	not available	31536900 C22B-01200E12A-4.3NB	40099400 C22B-01200E13A-4.3NB	
24 DC	1.32	24156800 C22B-02400E1-18.2NB	32092900 C22B-02400E2-18.2NB	24160200 C22B-02400E3A-18.2NB	24160300 C22B-02400E4A-18.2NB	not available	31156300 C22B-02400E12A-18.2NB	33089500 C22B-02400E13A-18.2NB	
27 DC	1.07	33570600 C22B-02700E1-25.3NB	on request	31802800 C22B-02700E3A-25.3NB	44646100 C22B-02700E4A-25.3NB	not available	31802900 C22B-02700E12A-25.3NB	on request	

**RPE3-06 with CSA certification
Surface treatment A: 240 h salt spray test acc. to ISO 9227**

Voltage [V]	Current [A]	Connector types	
		E1	E5
12 DC	2.79	24154300 C22A-01200E1-4.3NAH	not available
24 DC	1.32	24154400 C22A-02400E1-18.2NAH	not available

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

RPEW4-06*	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
		-30...+50 (-22...+122)	-30...+80 (-22...+176)	±10

RPEW4-06
Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types	
		EW1	EW2
12 DC	2.64	16205100 C22C-01200EW1-4.54NAM	16205400 C22C-01200EW2-4.54NAM
24 DC	1.32	16205000 C22C-02400EW1-18.2NAM	16205500 C22C-02400EW2-18.2NAM
106 DC	0.27	16205200 C22C-10600EW1-400NAM	not available

RPEW4-06 with CSA certification
Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Typy konektorů	
		EW1	EW2
12 DC	2.64	24154700 C22C-01200EW1-4.54NAH/M	24155500 C22C-01200EW2-4.54NAH/M
24 DC	1.32	24154900 C22C-02400EW1-18.2NAH/M	24155300 C22C-02400EW2-18.2NAH/M
106 DC	0.27	24155100 C22C-10600EW1-400NAH/M	not available

SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H, SD3E-C2/H	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
		-30...+80 (-22...+176)	-30...+80 (-22...+176)	±15

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

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

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

Voltage [V]	Current [A]	Connector type	
		E1	E13A
12 DC	1.83	40310200 C22B-01200E12A-6,55NB	on request
24 DC	0.95	30129500 C22B-02400E1-25,3NB	33028000 C22B-02400E13A-25,3NB

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

→ →	→ →
SD2P-B4/H, PVRM3-10	Ambient temperature °C (°F) -30 ...90 (-22 ...194), +100 (212) short time
	Fluid temperature °C (°F) -30 ...90 (-22 ...194), +100 (212) short time

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

Voltage [V]	Current [A]	Connector types	
		E3A	E12A E13A
12 DC max. 1.5	18838400 C22B-01200E1-5NA	24157900 C22B-01200E3A-5NA	18815901 C22B-01200E12A-5NA
		18838300 C22B-02400E1-13.4NA	19696200 C22B-02400E12A-13.4NA
24 DC max. 1	18838300 C22B-02400E1-13.4NA	19744300 C22B-02400E3A-13.4NA	30691600 C22B-02400E13A-13.4NA

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

Voltage [V]	Current [A]	Connector types	
		E3A	E12A E13A
12 DC max. 1.5	on request	41598800 C22B-01200E3A-5NB	41256200 C22B-01200E12A-5NB
		33288400 C22B-02400E3A-13.4NB	40948200 C22B-02400E12A-13.4NB
24 DC max. 1	34184200 C22B-02400E1-13.4NB		28811200 C22B-02400E13A-13.4NB

→ →	→ →
PRM2-06	Ambient temperature °C (°F) 30 ...+50 (-22 ...+122)
	Fluid temperature °C (°F) -30 ...+80 (-22 ...+176)

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	
12 DC max. 1.6	16187500 C22A-01200E1-5.15NA	16187500 C22A-01200E1-5.15NA	
		16186800 C22A-02400E1-13.4NA	
24 DC max. 1	16186800 C22A-02400E1-13.4NA		

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

RPE4-10	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U _N
	-30...+50 (-22...+122)	-30...+80 (-22...+176)	±10

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	3.26	16195700	27660800	16197001	16196901	E12A
		C31A-01200E1-3.68FA	C31A-01200E2-3.68FA	C31A-01200E3-3.68FA	C31A-01200E4-3.68FA	C31A-01200E12A-3.68FA
14 DC	2.98	16195900	27660900	on request	on request	on request
		C31A-01400E1-4.73FA	C31A-01400E2-4.73FA			
24 DC	1.78	16196100	23896000	16197201	16197101	33252300
		C31A-02400E1-13.5FA	C31A-02400E2-13.5FA	C31A-02400E3-13.5FA	C31A-02400E4-13.5FA	C31A-02400E12A-13.5FA
27 DC	1.52	16196300	27661000	27661301	27661401	on request
		C31A-02700E1-17.8FA	C31A-02700E2-17.8FA	C31A-02700E3-17.8FA	C31A-02700E4-17.8FA	C31A-02700E13A-17.8FA
205 DC	0.20	16196700	not available	not available	not available	not available
		C31A-20500E1-1027FA				
230 AC 50 Hz	0.20	not available	not available	not available	not available	not available

RPE4-10
Surface treatment B: 520 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types				
		E1	E2	E3	E4	E12A
12 DC	3.26	40135200	on request	on request	on request	E12A
		C31A-01200E1-3.68FB				C31A-01200E12A-3.68FB
24 DC	1.78	31648900	42422000	29427901	on request	44969200
		C31A-02400E1-13.5FB	C31A-02400E2-13.5FB	C31A-02400E3-13.5FB	on request	C31A-02400E13A-13.5FB
27 DC	1.52	40167600	not available	31803101	on request	on request
		C31A-02700E1-17.8FB		C31A-02700E3-17.8FB	on request	on request
205 DC	0.20	34353800	not available	not available	not available	not available
		C31A-20500E1-1027FB				

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

RPEW4-10	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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RPEW4-10 (Wirebox)
Surface treatment A: 240 h salt spray test acc. to ISO 9227

Voltage [V]	Current [A]	Connector types
12 DC	3.26	EW1 C31A-01200EW1-3.68FA/M
24 DC	1.78	EW1 C31A-02400EW1-13.5FA/M
106 DC	0.42	EW1 C31A-10600EW1-252FA/M

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	0.42	EW1 C31A-10600EW1-252FAH/M

PRM6-10, PRM7-10

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

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

Voltage [V]	Current [A]	Connector types
12 DC	max. 1.9	E1 E2 16195800 C31A-01200E1-4.73FA on request
24 DC	max. 1.1	E1 E2 16196100 C31A-02400E1-13.5FA

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

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

Voltage [V]	Current [A]	Connector types
24 DC	max. 1.1	E1 E2 31648900 C31A-02400E1-13.5FB

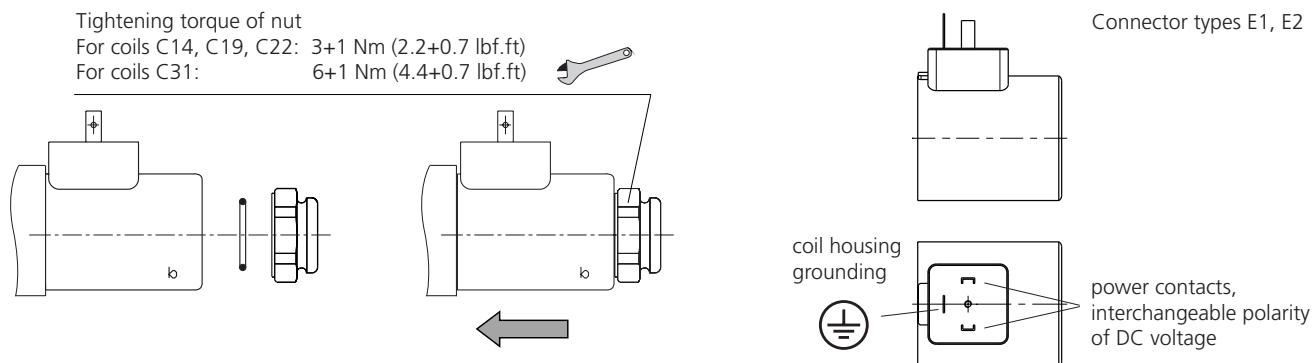
Ambient temperature °C (°F) 30 ...+50 (-22 ...+122)	Fluid temperature °C (°F) -30...+80 (-22...+176)
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C14B					
E1, E2	IP65	E3A, E4A	IP67	E12A, E13A	IP67 / IP69K
C19A					
E1, E2	IP65	E5	IP65		
C19B					
E1, E2	IP65	E5, E51	IP65	E3, E4	IP67
E3A, EA4	IP67	E12A, E13A	IP67 / IP69K	E8, E9	
C22A					
E1, E2	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	EW1 IP65	

Mounting / dismantling the coils



- › Choose the correct coil type according to the valve type given in this datasheet 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 datasheet of the relevant solenoid operated valve and the coil description is given in the datasheet HA 8007.



CAUTION

- › The electrical supply parameters must be appropriate for the coil type. The coils on switching valves are voltage controlled. The supply voltage should be within $\pm 10\%$ of the nominal voltage unless otherwise specified in the valve catalog. Coils on proportional valves are current controlled. The limit (maximum current) that may flow through the coil on a continuous basis is listed in the coil type table.
- › 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 datasheet 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.
- › The specified IP rating applies only in the case of correctly connected connectors (male + female) with the corresponding IP rating.



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.