

**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 data sheet			
Nominal and max. current	A	see the table of coil types			
Winding resistance at 20 °C	$\Omega$	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 data sheet			
Operation conditions		see the data sheets of individual types of valves			
Max. winding temperature	°C (°F)	155 (311)			
Approximate weight of the coils	Coil size	C14	C19	C22	C31
	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			

**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**

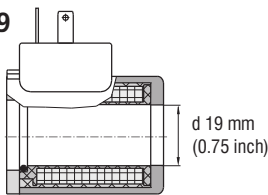
Induced voltage originating from a quick disconnect of the coil has according to Lenz's law a negative effect on OFF switching time regarding the solenoid armature. Special electronic circuit suppresses this unwanted phenomenon.

## 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 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



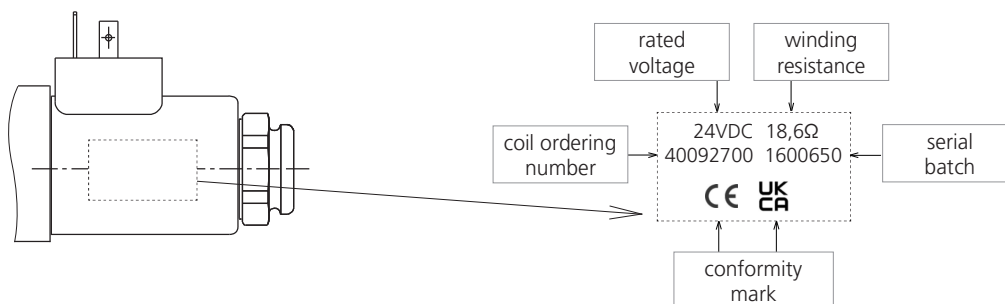
Connector EW



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.

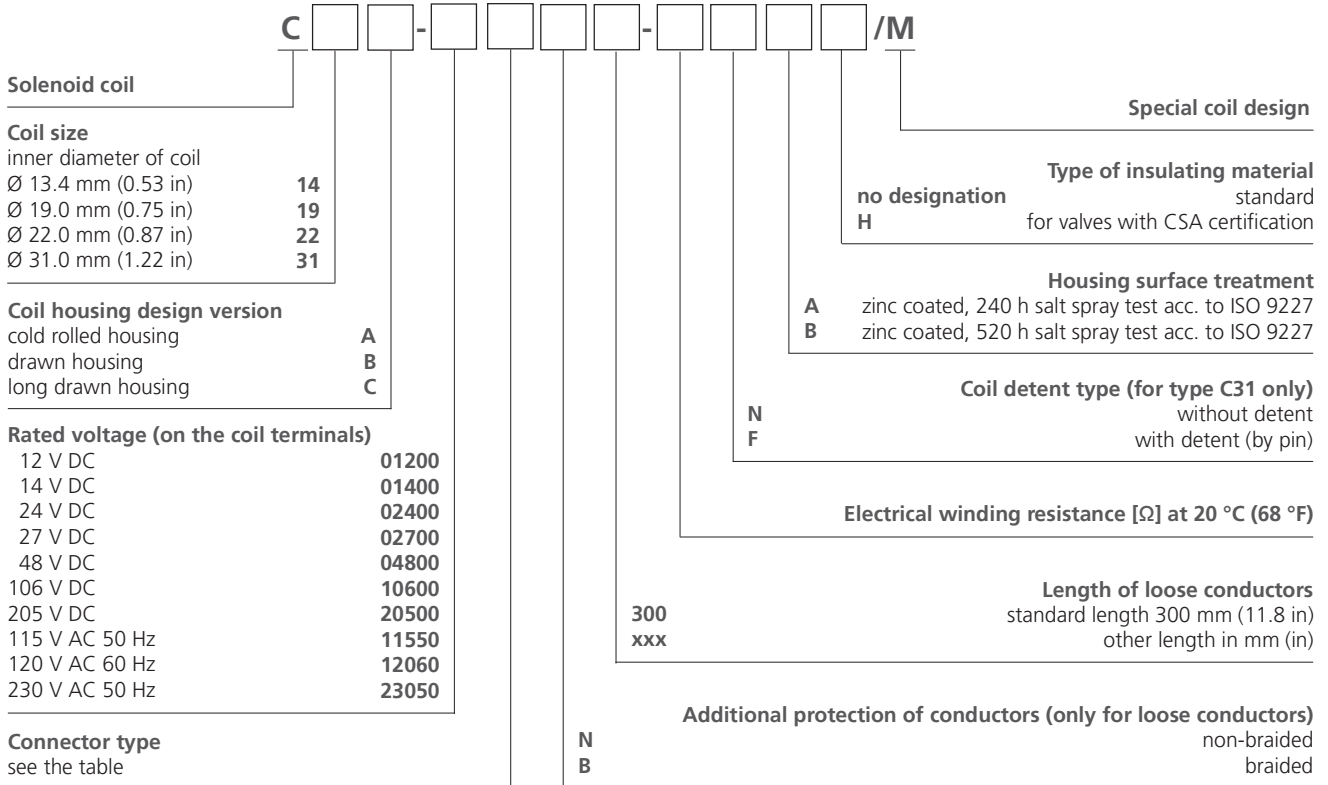


**Example of coil description:**  
Type sticker information can differ due to huge variety of coil designs.

## Content

<b>Ordering Code</b> .....	<b>4</b>
<b>Coils C14B</b> (d = 13.4 mm (0.53 inch)).....	<b>5</b>
RPEK1-03, RPEL1-04 .....	5
SD2E-A2/L, SD2E-A3/L, SD2E-A4/L, SD3E-A2/L.....	5
SP4P1-B4, SD3P-A2 .....	5
<b>Coils C19</b> (d = 19 mm (0.75 inch)).....	<b>6</b>
RPE2-04, RPE3-04, RPEL2-06, ROE3-04, ROE3-06, SR1E2-A2, SR4E2-B2, SP4E1-B3.....	6
SD2E-B2/L, SD2E-B3/L, SD2E-B4/L, SD3E-B2/L .....	6
SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3 .....	6
RPE3-04 s certifikací CSA .....	6
SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3, SR4E-B2, SD3P-B2 .....	7
PRM2-04, PRM7-04 .....	8
PRM2-04 proporcionální rozváděče bez integrované elektroniky.....	8
PRM2-04, PRM7-04 proporcionální rozváděče s integrovanou elektronikou.....	8
SR1P2-A2, SRN1P1-A2, SR4P2-B2, SRN4P1-B2, SP4P2-B3, SPN4P1-B3 .....	8
SR1P2-A2, SRN1P1-A2, SR4P2-B2, SRN4P1-B2, SP4P2-B3, SPN4P1-B3, PVRM1-063.....	9
<b>Coils C22</b> (d = 22 mm (0.87 inch)).....	<b>10</b>
RPE3-06, RPER3-06, RPEL1-10, RPE3-06 with CSA certification .....	10
SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H, SD3E-C2/H .....	10
RPEW4-06 , RPEW4-06 with CSA certification.....	11
SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H, SD3E-C2/H .....	11
SD2P-B4, PVRM3-10 .....	12
PRM2-06 proportional directional control valves with integrated electronic unit .....	12
PRM2-06, PRM7-06, PRM8-06, proportional directional control valves without integrated electronic unit.....	13
PRMR2-06 proportional directional control valves, with auxiliary lever override.....	13
SF32P-C3 .....	13
<b>Coils C31</b> (d = 31 mm (1.22 inch)).....	<b>14</b>
RPE4-10.....	14
RPEW4-10, RPEW4-10 with CSA certification.....	15
PRM6-10, PRM7-10 .....	15
<b>Dimensions</b> in millimeters (inch).....	<b>16</b>
<b>Mounting / dismantling the coils</b> .....	<b>18</b>

## Ordering Code



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 <sub>n</sub>
<b>RPEK1-03, RPEL1-04</b>	→	-30...+50 (-22...+122)	-30...+80 (-22...+176)	± 10
<b>SD2E-A2/L, SD2E-A3/L, SD2E-A4/L, SD3E-A2/L</b>	→	-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	E1	E2	E3A	E4A	E12A	E13A
12 DC	1.83	C14B-01200E1-6.55NA	<b>16210300</b>	<b>24101600</b> C14B-01200E2-6.55NA	<b>28822500</b> C14B-01200E3A-6.55NA	<b>28822600</b> C14B-01200E4A-6.55NA	<b>29268200</b> C14B-01200E12A-6.55NA	<b>29268800</b> C14B-01200E13A-6.55NA
14 DC	1.57	C14B-01400E1-8.91NA	<b>24102200</b> C14B-01400E3A-8.91NA	on request	<b>41194600</b> C14B-01400E3A-8.91NA	<b>40291000</b> C14B-01400E4A-8.91NA	<b>34948600</b> C14B-01400E12A-8.91NA	<b>40498900</b> C14B-01400E13A-8.91NA
24 DC	0.92	C14B-02400E1-26.2NA	<b>16210400</b> C14B-02400E1-26.2NA	<b>24101800</b> C14B-02400E2-26.2NA	<b>28686400</b> C14B-02400E3A-26.2NA	<b>28822400</b> C14B-02400E4A-26.2NA	<b>29268900</b> C14B-02400E12A-26.2NA	<b>29269000</b> C14B-02400E13A-26.2NA
27 DC	0.80	C14B-02700E1-33.6NA	<b>33565000</b> C14B-02700E1-33.6NA	on request	<b>34319700</b> C14B-02700E3A-33.6NA	on request	<b>43070900</b> C14B-02700E12A-33.6NA	<b>40648800</b> C14B-02700E13A-33.6NA

**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	C14B-01200E1-6.55NB	<b>42978200</b> C14B-01200E1-6.55NB	<b>44465700</b> C14B-01200E2-6.55NB	on request	on request	<b>32700900</b> C14B-01200E12A-6.55NB	on request
14 DC	1.57	on request	on request	on request	on request	on request	<b>34440200</b> C14B-01400E12A-8.91NB	on request
24 DC	0.92	C14B-02400E1-26.2NB	<b>33469800</b> C14B-02400E1-26.2NB	on request	<b>41702200</b> C14B-02400E3A-26.2NB	on request	<b>31145400</b> C14B-02400E12A-26.2NB	<b>31145500</b> C14B-02400E13A-26.2NB

<b>SP4P1-B4</b>	→	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	E13A
12 DC	max. 0.7	on request	<b>33038300</b> C14B-01200E3A-7.8NA	<b>33038400</b> C14B-02400E3A-29.5NA	<b>32482500</b> C14B-01200E12A-7.8NA	<b>437442</b> C14B-02400E13A-29.5NA
24 DC	max. 0.35	C14B-02400E1-29.5NA	<b>34056200</b> C14B-02400E1-29.5NA	<b>33038400</b> C14B-02400E3A-29.5NA	<b>32482400</b> C14B-02400E12A-29.5NA	

**Surface treatment B: 520 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	on request	<b>40933100</b> C14B-01200E12A-7.8NB
24 DC	max. 0.35	on request	on request	on request	<b>34186400</b> C14B-02400E12A-29.5NB

<b>SD3P-A2/H</b>	→	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	E3A	E12A	E13A
12 DC	max. 0.950	C14B-01200E1-6.55NB	<b>42978200</b> C14B-01200E1-6.55NB	<b>44465700</b> C14B-01200E2-6.55NB	on request	<b>32700900</b> C14B-01200E12A-6.55NB	on request
24 DC	max. 0.475	C14B-02400E1-26.2NB	<b>33469800</b> C14B-02400E1-26.2NB	on request	<b>41702200</b> C14B-02400E3A-26.2NB	<b>31145400</b> C14B-02400E12A-26.2NB	<b>31145500</b> 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 <sub>n</sub>
→	-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, 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	27668700 C19B-20500E1-2065NA	not available	not available	not available	not available	not available	not available	not available
120 AC	0.22	27642700 C19B-12060E5-494NA							
60 Hz									
230 AC	0.12	27668600 C19B-23050E5-2065NA							
50 Hz									

**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	32092500 C19B-02400E2-20.8NB	on request	44017500 C19B-02400E3A-20.8NB	43191500 C19B-02400E4A-20.8NB	40384800 C19B-02400E12A-20.8NB	31330200 C19B-02400E13A-20.8NB
27 DC	0.89	41176700 C19B-02700E1-30.4NB	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	
		E1	
12 DC	2.41	24140700 C19A-01200E1-4.98NAH	
24 DC	1.15	24140800 C19A-02400E1-2.1NAH	

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

<b>SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3, SR4E2-B2</b>		Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U <sub>n</sub>
		-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]	E1	E2	E3	E4	E3A	E4A	E12A	E13A
12 DC	2,00	27669700 C19B-01200E1-6NA	27669900 C19B-01200E2-6NA	27670000 C19B-01200E3-6NA	27670100 C19B-01200E4-6NA	on request	on request	32829300 C19B-01200E12A-6NA	29871300 C19B-01200E13A-6NA
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	0,93	27670600 C19B-02400E1-25,75NA	27670700 C19B-02400E2-25,75NA	27670800 C19B-02400E3-25,75NA	27670900 C19B-02400E4-25,75NA	on request	30117800 C19B-02400E4A-25,75NA	31330000 C19B-02400E12A-25,75NA	32801600 C19B-02400E13A-25,75NA
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	27668700 C19B-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 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]	E1	E2	E3	E12A
12 DC	2,00	42808800 C19B-01200E1-6NB	43195300 C19B-01200E2-6NB	on request	40932800 C19B-01200E12A-6NB
24 DC	0,93	30449100 C19B-02400E1-25,75NB	41894800 C19B-02400E2-25,75NB	33090800 C19B-02400E3-25,75NB	40932900 C19B-02400E12A-25,75NB

<b>SD3P-B2/H</b>		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]	E1	E2	E3	E3A	E4A	E12A	E13A
12 DC	max. 1,2	40134900 C19B-01200E1-4,9NB	on request	42999500 C19B-01200E3-4,9NB	on request	43486900 C19B-01200E4A-4,9NB	40317600 C19B-01200E12A-4,9NB	43930600 C19B-01200E13A-4,9NB
24 DC	max. 0,6	28829600 C19B-02400E1-20,8NB	32092500 C19B-02400E2-20,8NB	on request	44017500 C19B-02400E3A-20,8NB	43191500 C19B-02400E4A-20,8NB	40384800 C19B-02400E12A-20,8NB	31330200 C19B-02400E13A-20,8NB



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

Ambient temperature °C (°F)	Fluid temperature °C (°F)
30 ...+50 (-22 ...+122)	-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	E2	E3	E4	E3A	E12A	E13A
12 DC	max. 1,7	C19B-01200E1-4.68NA	27821900 on request	27822000 C19B-01200E3-4.68NA	27785600 C19B-01200E4-4.68NA	31688600 C19B-01200E3A-4.68NA	27821200 C19B-01200E12A-4.68NA	on request
24 DC	max. 0,8	C19B-02400E1-20.6NA	27824200 C19B-02400E2-20.6NA	28145200 C19B-02400E3-20.6NA	27824400 C19B-02400E4-20.6NA	31891300 C19B-02400E3A-20.6NA	30754900 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	E3A	E12A	E13A
24 DC	max. 0,8	C19B-02400E1-20.6NB	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

**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	E2	E3	E4
12 DC	max. 1,7	C19A-01200E1-4.98NA	16186100 C19A-01200E2-4.98NA	16191100 C19A-01200E3-4.98NA	16191300 C19A-01200E4-4.98NA
24 DC	max. 0,8	C19A-02400E1-2.1NA	16191700 C19A-02400E2-2.1NA	16191200 C19A-02400E3-2.1NA	16191400 C19A-02400E4-2.1NA

Ambient temperature °C (°F)	Fluid temperature °C (°F)
-30...+80 (-22...+176)	-30...+120 (-22...+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	E2	E3	E4	E3A	E12A	E13A
12 DC	max. 1	C19B-01200E1-6.5NA	28145500 C19B-01200E2-6.5NA	28145700 C19B-01200E3-6.5NA	28145800 C19B-01200E4-6.5NA	33793600 C19B-01200E3A-6.5NA	28184900 C19B-01200E12A-6.5NA	29867600 C19B-01200E13A-6.5NA
24 DC	max. 0,6	C19B-02400E1-20.6NA	27824200 C19B-02400E2-20.6NA	28145200 C19B-02400E3-20.6NA	27824400 C19B-02400E4-20.6NA	31891300 C19B-02400E3A-20.6NA	30754900 C19B-02400E12A-20.6NA	29868600 C19B-02400E13A-20.6NA



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

<b>SR1P2-A2, SRN1P1-A2, SR4P2-B2, SRN4P1-B2, SP4P2-B3, SPN4P1-B3</b>
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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	E1	E2	E3	E3A	E12A	E13A
12 DC	max. 1		40406300 C19B-01200E1-6.5NB	on request	on request	on request	40406200 C19B-01200E12A-6.5NB	on request
24 DC	max. 0.6		40406400 C19B-02400E1-20.6NB	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

<b>PVRM11-063</b>
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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	E13A
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]	Stecker typen	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	27824300 C19B-02400E2-20.6NA	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 <sub>n</sub>	
<b>RPE3-06, RPER3-06, RPEL1-10</b>	-30...+50 (-22...+122)	-30...+80 (-22...+176)	± 10			
<b>SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H, SD3E-C2/H</b>	-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
12 DC	2.72	<b>16211400</b>	<b>24156100</b>	<b>24159600</b>	<b>24159700</b>	<b>24930801</b>
		C22B-01200E1-4.41NA	C22B-01200E2-4.41NA	C22B-01200E3A-4.41NA	C22B-01200E4A-4.41NA	C22B-01200E13A-4.41NA
14 DC	2.14	<b>24158200</b>	<b>24930900</b>	<b>27662100</b>	<b>27662200</b>	<b>27663000</b>
		C22B-01400E1-6.55NA	C22B-01400E2-6.55NA	C22B-01400E3A-6.55NA	C22B-01400E4A-6.55NA	C22B-01400E13A-6.55NA
24 DC	1.29	<b>16211600</b>	<b>24157400</b>	<b>24159800</b>	<b>24159900</b>	<b>19695900</b>
		C22B-02400E1-18.6NA	C22B-02400E2-18.6NA	C22B-02400E3A-18.6NA	C22B-02400E4A-18.6NA	C22B-02400E13A-18.6NA
27 DC	1.07	<b>16211700</b>	<b>24157600</b>	<b>19744600</b>	<b>19744500</b>	<b>27663200</b>
		C22B-02700E1-25.3NA	C22B-02700E2-25.3NA	C22B-02700E3A-25.3NA	C22B-02700E4A-25.3NA	C22B-02700E13A-25.3NA
205 DC	0.15	<b>16211500</b>	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	<b>18849000</b>
						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
12 DC	2.72	<b>34007700</b>	<b>32489000</b>	<b>43962500</b>	on request	<b>31536900</b>
		C22B-01200E1-4.41NB	C22B-01200E2-4.41NB	C22B-01200E3A-4.41NB	C22B-01200E4A-4.41NB	C22B-01200E13A-4.41NB
24 DC	1.29	<b>24156800</b>	<b>32092900</b>	<b>24160200</b>	<b>24160300</b>	<b>31156300</b>
		C22B-02400E1-18.6NB	C22B-02400E2-18.6NB	C22B-02400E3A-18.6NB	C22B-02400E4A-18.6NB	C22B-02400E13A-18.6NB
27 DC	1.07	<b>33570600</b>	on request	<b>31802800</b>	<b>44646100</b>	<b>31802900</b>
		C22B-02700E1-25.3NB	C22B-02700E3A-25.3NB	C22B-02700E4A-25.3NB	C22B-02700E13A-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	2.72	<b>24154300</b>	not available
		C22A-01200E1-4.41NAH	
24 DC	1.29	<b>24154400</b>	not available
		C22A-02400E1-18.6NAH	
115 AC 50 Hz	0.30	not available	<b>24154500</b>
			C22A-1150E5-344NAH
230 AC 50 Hz	0.15	not available	<b>24154600</b>
			C22A-23050E5-1393NAH

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

<b>RPEW4-06*</b>	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U <sub>n</sub>
		-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-01200EW1-4.54NA/M	16205400 C22C-01200EW2-4.54NA/M
24 DC	1.32	16205000 C22C-02400EW1-18.2NA/M	16205500 C22C-02400EW2-18.2NA/M
106 DC	0.27	16205200 C22C-10600EW1-400NA/M	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

<b>SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H, SD3E-C2/H</b>	→	Ambient temperature °C (°F)	Fluid temperature °C (°F)	Supply voltage tolerance % of U <sub>n</sub>
		-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	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))

<b>SD2P-B4/H, PVRM3-10</b>	→ →	Ambient temperature °C (°F) -30 ...90 (-22 ...194), +100 (212) short time	Fluid temperature °C (°F) -30 ...90 (-22 ...194), +100 (212) short time
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**Surface treatment A: 240 h salt spray test acc. to ISO 9227**

Voltage [V]	Current [A]	Connector types	
		E3A	E12A
12 DC	max. 1,5	18838400 C22B-01200E1-5NA	E13A 31323800 C22B-01200E12A-5NA
		18838300 C22B-02400E1-13.4NA	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
12 DC	max. 1.5 on request	41598800 C22B-01200E3A-5NB	E13A on request
		34184200 C22B-02400E1-13.4NB	28811200 C22B-02400E13A-13.4NB

<b>PRM2-06</b>	→ →	Ambient temperature °C (°F) 30 ...+50 (-22 ...+122)	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	E13A
12 DC	max. 1,6	16187500 C22A-01200E1-5.15NA	
		16186800 C22A-02400E1-13.4NA	

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

PRM2-06, PVRM2-06, PRM7-06, PRM8-06, PRMR2-06	→ →	Ambient temperature °C (°F)	Fluid temperature °C (°F)
		30 ... +50 (-22 ... +122)	-30 ... +80 (-22 ... +176)

**PRM2-06, PRM7-06, PRM8-06 proportional directional control valves without integrated electronic unit, PRMR2-06**

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

Voltage [V]	Current [A]	Connector types	E1	E3A	E4A	E12A	E13A
12 DC	max. 2.5		18838500	19744700	on request	19696100	19909300
			C22B-01200E1-2.33NA	C22B-01200E3A-2.33NA	on request	C22B-01200E12A-2.33NA	C22B-01200E13A-2.33NA
24 DC	max. 1		18838300	19744300	40755800	19696200	30691600
			C22B-02400E1-13.4NA	C22B-02400E3A-13.4NA	C22B-02400E4A-13.4NA	C22B-02400E12A-13.4NA	C22B-02400E13A-13.4NA

**PRM2-06, PRM7-06, PRM8-06 proportional directional control valves without integrated electronic unit, PRMR2-06**

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

Voltage [V]	Current [A]	Connector types	E1	E3A	E4A	E12A	E13A
12 DC	max. 2.5		34180800	43850600	42752300	40426100	on request
			C22B-01200E1-2.33NB	C22B-01200E3A-2.33NB	C22B-01200E4A-2.33NB	C22B-01200E12A-2.33NB	on request
24 DC	max. 1		34184200	33288400	on request	40948200	28811200
			C22B-02400E1-13.4NB	C22B-02400E3A-13.4NB	on request	C22B-02400E12A-13.4NB	C22B-02400E13A-13.4NB

**SF32P-C3**

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

**B: 520 h v NSS podle ISO 9227**

Voltage [V]	Current [A]	Connector types	E1	E3A	E4A	E12A	E13A
12 DC	max. 2.6		34180800	43850600	42752300	40426100	on request
			C22B-01200E1-2.33NB	C22B-01200E3A-2.33NB	C22B-01200E4A-2.33NB	C22B-01200E12A-2.33NB	on request
24 DC	max. 1		43534000	on request	on request	43498500	on request
			C22B-02400E1-13.1NB	on request	on request	C22B-02400E12A-13.1NB	on request

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

<b>RPE4-10</b>	→	Ambient temperature °C (°F) -30...+50 (-22...+122)	Fluid temperature °C (°F) -30...+80 (-22...+176)	Supply voltage tolerance % of U <sub>n</sub> ± 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	16195700	27660800	16197001	16196901	E12A 33252200
		C31A-01200E1-3.78FA	C31A-01200E2-3.78FA	C31A-01200E3-3.78FA	C31A-01200E4-3.78FA	C31A-01200E12A-3.78FA
14 DC	2.98	16195900	27660900	on request	on request	on request
		C31A-01400E1-4.73FA	C31A-01400E2-4.73FA			
24 DC	1.73	16196100	23896000	16197201	16197101	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	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
230 AC 50 Hz	0.20	C31A-20500E1-1027FA	not available	not available	not available	16195101
		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				
		E1	E2	E3	E4	E12A
12 DC	3.17	40135200	on request	on request	on request	41292600
		C31A-01200E1-3.78FB				C31A-01200E12A-3.78FB
24 DC	1.73	31648900	42422000	29427901	on request	41292600
		C31A-02400E1-13.9FB	C31A-02400E2-13.9FB	C31A-02400E3-13.9FB	on request	C31A-02400E12A-13.9FB
27 DC	1.52	40167600	not available	31803101	on request	on request
		C31A-02700E1-17.8FB		C31A-02700E3-17.8FB	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))**

<b>RPEW4-10</b>	Ambient temperature °C (°F) -30...+50 (-22...+122)	Fluid temperature °C (°F) -30...+80 (-22...+176)	Supply voltage tolerance % of U <sub>n</sub> ± 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	3.17	EW1 24172000 C31A-01200EW1-3.78FA/M
24 DC	1.73	24172200 C31A-02400EW1-13.9FA/M
106 DC	0.38	24172400 C31A-10600EW1-276FA/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	0.38	EW1 24172600 C31A-10600EW1-276FAH/M

**PRM6-10, PRIM7-10**

Ambient temperature °C (°F) 30 ...+50 (-22 ...+122)	Fluid temperature °C (°F) -30...+80 (-22...+176)
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**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-01200E1-4.73FA
24 DC	max. 1,1	E2 23896000 C31A-02400E2-13.9FA

Ambient temperature °C (°F)	Fluid temperature °C (°F)
30 ...+50 (-22 ...+122)	-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 31648900 C31A-02400E1-13.9FB

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



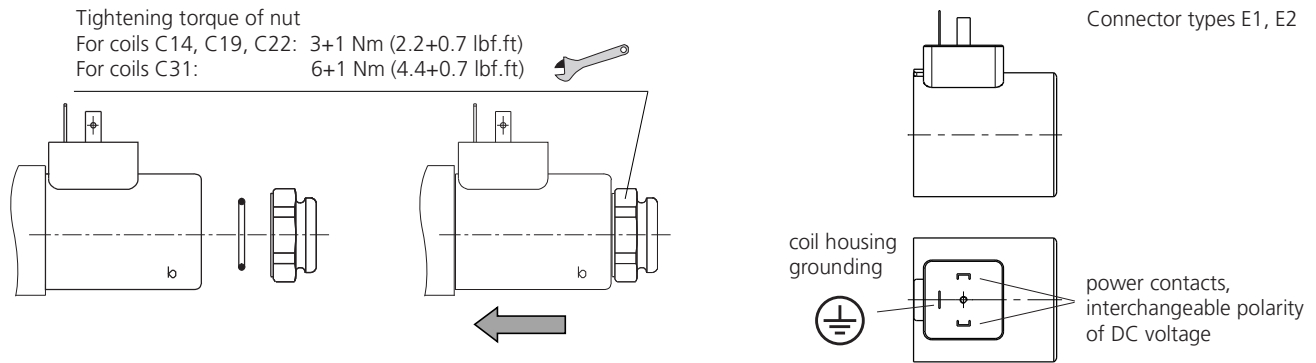
**Dimensions in millimeters (inch)**

C14B		C19A		C19B		C22A	
E1, E2	IP65	E1, E2	IP65	E1, E2	IP65	E1, E2	IP65
E3A, E4A	IP67	E5	IP65	E5, E51	IP65	E3A, EA4	IP67
E12A, E13A	IP67 / IP69K			E12A, E13A	IP67 / IP69K	E8, E9	

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 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

- › 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 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.