

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 ±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 | 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 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 | 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 | | | |

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

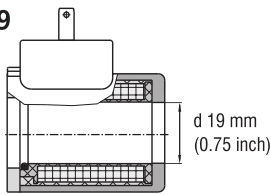
Induced voltage originating from a quick disconnect of the coil has according to Lenz's law a negative effect on OFF switching time regarding the solenoid armature. Special electronic circuit suppresses this unwanted phenomenon.

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 without ground contact (IP65)
- › 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
without ground contact



EN 175301-803-A



AMP JUNIOR TIMER



DEUTSCH DT04-2P



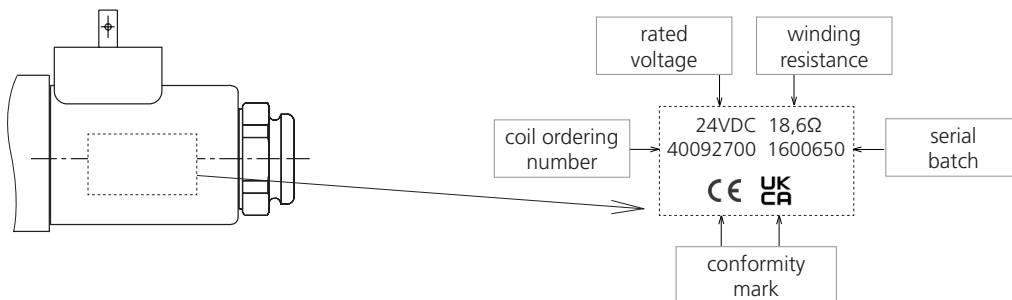
Connector EW



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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| Mounting / dismantling the coils | 18 |

Ordering Code

| | | | |
|--|--|---|--|
| Solenoid coil | | C [] [] - [] [] [] [] - [] [] [] [] /M | Special coil design |
| Coil size | | | Type of insulating material |
| inner diameter of coil | | | standard |
| Ø 13.4 mm (0.53 in) | | 14 | H for valves with CSA certification |
| 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 | | | Housing surface treatment |
| cold rolled housing | | A | A zinc coated, 240 h salt spray test acc. to ISO 9227 |
| drawn housing | | B | B zinc coated, 520 h salt spray test acc. to ISO 9227 |
| long drawn housing | | C | |
| Rated voltage (on the coil terminals) | | | Coil detent type (for type C31 only) |
| 12 V DC | | 01200 | without detent |
| 14 V DC | | 01400 | F with detent (by pin) |
| 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 | | | Electrical winding resistance [Ω] at 20 °C (68 °F) |
| see the table | | | 300 |
| | | | xxx |
| | | N | Length of loose conductors |
| | | B | 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 without ground contact |
| | E2 | Connector EN 175301-803-A without ground contact + quenching diode |
| | E1G | Connector EN 175301-803-A |
| | E2G | 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 | | E4A | E12A | E13A |
|-------------|-------------|--|---|---|--|--|
| | | E2 | E3A | | | |
| 12 DC | 1.83 | 16210300 C14B-01200E1-6.55NA | 28822500 C14B-01200E3A-6.55NA | 28822600 C14B-01200E4A-6.55NA | 29268200 C14B-01200E12A-6.55NA | 29268800 C14B-01200E13A-6.55NA |
| 14 DC | 1.57 | 24102200 C14B-01400E1-8.91NA | 41194600 C14B-01400E3A-8.91NA | 40291000 C14B-01400E4A-8.91NA | 34948600 C14B-01400E12A-8.91NA | 40498900 C14B-01400E13A-8.91NA |
| 24 DC | 0.92 | 16210400 C14B-02400E1-26.2NA | 28686400 C14B-02400E3A-26.2NA | 28822400 C14B-02400E4A-26.2NA | 29268900 C14B-02400E12A-26.2NA | 29269000 C14B-02400E13A-26.2NA |
| 27 DC | 0.80 | 33565000 C14B-02700E1-33.6NA | 34319700 C14B-02700E3A-33.6NA | on request | 43070900 C14B-02700E12A-33.6NA | 40648800 C14B-02700E13A-33.6NA |

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

| Voltage [V] | Current [A] | Connector types | | E4A | E12A | E13A |
|-------------|-------------|--|------------|------------|--|--|
| | | E2 | E3A | | | |
| 12 DC | 1.83 | 42978200 C14B-01200E1-6.55NB | on request | on request | 32700900 C14B-01200E12A-6.55NB | on request |
| 14 DC | 1.57 | on request | on request | on request | 34440200 C14B-01400E12A-8.91NB | on request |
| 24 DC | 0.92 | 33469800 C14B-02400E1-26.2NB | on request | on request | 31145400 C14B-02400E12A-26.2NB | 31145500 C14B-02400E13A-26.2NB |

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 | | E13A |
|-------------|-------------|--|---|--|
| | | E3A | E12A | |
| 12 DC | max. 0.7 | 33038300 C14B-01200E3A-7.8NA | 32482500 C14B-01200E12A-7.8NA | 437442 C14B-02400E13A-29.5NA |
| 24 DC | max. 0.35 | 34056200 C14B-02400E1-29.5NA | 32482400 C14B-02400E3A-29.5NA | |

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

| Voltage [V] | Current [A] | Connector types | | E3A | E12A |
|-------------|-------------|-----------------|------------|------------|--|
| | | E1 | E1 | | |
| 12 DC | max. 0.7 | on request | on request | on request | 40933100 C14B-01200E12A-7.8NB |
| 24 DC | max. 0.35 | on request | on request | on request | 34186400 C14B-02400E12A-29.5NB |

SD3P-A2/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 | | E2 | E3A | E12A | E13A |
|-------------|-------------|--|------------|---|------------|--|------------|
| | | E1 | E1 | | | | |
| 12 DC | max. 0.950 | 42978200 C14B-01200E1-6.55NB | on request | 44465700 C14B-01200E2-6.55NB | on request | 32700900 C14B-01200E12A-6.55NB | on request |
| 24 DC | max. 0.475 | 33469800 C14B-02400E1-26.2NB | on request | 41702200 C14B-02400E3A-26.2NB | on request | 31145500 C14B-02400E13A-26.2NB | |

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

| |
|---|
| 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 |

| | | |
|-----------------------------|---------------------------|--|
| 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 |
| -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, E1G | 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-20500E1G-2065NA | 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 | 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 | 41167700 C19B-02700E1-30.4NB | on request | on request | 33559000 C19B-02700E3A-30.4NB | 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] | Connector types |
| 12 DC | 24140700 C19A-01200E1G-4.98NAH |
| 24 DC | 24140800 C19A-02400E1G-2.1NAH |

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

| | |
|--|---|
| SD2E-A2/H, SD2E-A3/H, SD2E-A4/H, SD3E-A2/H, SD1E-A2, SD1E-A3, SR4E-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, E1G | 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 | on request | 30117800 C19B-02400E4A-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-20500E1G-2065NA | not available | not available | not available | not available | not available | not available | not available |
| [V] | [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] | Connector types | | |
|----------------|----------------|---|---|---|
| | | E1 | E2 | E3 |
| 12 DC | 2,00 | 42808800 C19B-01200E1-6NB | 43195300 C19B-01200E2-6NB | 40932800 C19B-01200E12A-6NB |
| 24 DC | 0,93 | 30449100 C19B-02400E1-25,75NB | 41894800 C19B-02400E2-25,75NB | 40932900 C19B-02400E12A-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 | E3A |
| 12 DC | max. 1,2 | 40134900 C19B-01200E1-4,9NB | on request | 42999500 C19B-01200E3-4,9NB | on request |
| 24 DC | max. 0,6 | 28829600 C19B-02400E1-20,8NB | 32092500 C19B-02400E2-20,8NB | on request | 44017500 C19B-02400E3A-20,8NB |
| | | | | 43486900 C19B-01200E4A-4,9NB | 43191500 C19B-02400E4A-20,8NB |
| | | | | E4A | E4A |
| | | | | 40317600 C19B-01200E12A-4,9NB | 40317600 C19B-01200E12A-4,9NB |
| | | | | E12A | E12A |
| | | | | E13A | E13A |
| | | | | 43930600 C19B-01200E13A-4,9NB | 43930600 C19B-01200E13A-4,9NB |
| | | | | 40384800 C19B-02400E12A-20,8NB | 40384800 C19B-02400E12A-20,8NB |
| | | | | 31330200 C19B-02400E13A-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 | | | | |
|-------------|-------------|---------------------|---------------------|---------------------|---------------------|-----------------------|
| | | E1 | E2 | E3 | E4 | E13A |
| 12 DC | max. 1,7 | 27821900 | on request | 27822000 | 27785600 | 27821200 |
| | | C19B-01200E1-4.68NA | C19B-01200E3-4.68NA | C19B-01200E4-4.68NA | C19B-01200E4-4.68NA | C19B-01200E12A-4.68NA |
| 24 DC | max. 0,8 | 27824200 | 27824300 | 28145200 | 27824400 | 30754900 |
| | | C19B-02400E1-20.6NA | C19B-02400E2-20.6NA | C19B-02400E3-20.6NA | C19B-02400E4-20.6NA | C19B-02400E3A-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 | E13A |
| 24 DC | max. 0,8 | 40406400 | 31805200 | 40457400 |
| | | C19B-02400E1-20.6NB | C19B-02400E2-20.6NB | C19B-02400E12A-20.6NB |
| | | | | 31805300 |
| | | | | 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 | | | |
|-------------|-------------|----------------------|----------------------|---------------------|---------------------|
| | | E1G | E2G | E3 | E4 |
| 12 DC | max. 1,7 | 16186100 | 16191600 | 16191100 | 16191300 |
| | | C19A-01200E1G-4.98NA | C19A-01200E2G-4.98NA | C19A-01200E3-4.98NA | C19A-01200E4-4.98NA |
| 24 DC | max. 0,8 | 16186200 | 16191700 | 16191200 | 16191400 |
| | | C19A-02400E1G-21NA | C19A-02400E2G-21NA | C19A-02400E3-21NA | C19A-02400E4-21NA |

| | |
|-----------------------------|---------------------------|
| 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 | | | | |
|-------------|-------------|---------------------|---------------------|---------------------|---------------------|-----------------------|
| | | E1 | E2 | E3 | E4 | E13A |
| 12 DC | max. 1 | 28145500 | 28145600 | 28145700 | 28145800 | 28184900 |
| | | C19B-01200E1-6.5NA | C19B-01200E2-6.5NA | C19B-01200E3-6.5NA | C19B-01200E4-6.5NA | C19B-01200E12A-6.5NA |
| 24 DC | max. 0,6 | 27824200 | 27824300 | 28145200 | 27824400 | 30754900 |
| | | C19B-02400E1-20.6NA | C19B-02400E2-20.6NA | C19B-02400E3-20.6NA | C19B-02400E4-20.6NA | C19B-02400E3A-20.6NA |
| | | | | | | 29868600 |
| | | | | | | C19B-02400E13A-20.6NA |

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

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

| | |
|-----------------------------|-----------------------------|
| Ambient temperature °C (°F) | Ambient 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 | C19B-01200E1-6.5NB | on request | on request | on request | 40406200 C19B-01200E12A-6.5NB | on request |
| 24 DC | max. 0.6 | 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 |

| |
|------------------|
| 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 | C19B-01200E13A-6.85NA |

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

| Voltage [V] | Current [A] | Connector types | E3 | E3A | E4 | E12A | E13A |
|-------------|-------------|---------------------|---------------------------------|----------------------------------|---------------------------------|-----------------------------------|-----------------------------------|
| 12 DC | max. 1,5 | C19B-01200E1-4,68NA | 27822000 C19B-01200E3-4,68NA | 31688600 C19B-01200E3A-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 | E3A | E4 | E12A | E13A |
|-------------|-------------|-----------------|------------|------------|------------|-----------------------------------|------------|
| 12 DC | max. 1,5 | on request | on request | 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 | C19B-02400E1-20.6NA | 27824200 C19B-02400E2-20.6NA | 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 | 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 |

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

| | Ambient temperature °C (°F) | Fluid temperature °C (°F) | Supply voltage tolerance % of U _n |
|--|-----------------------------|---------------------------|--|
| RPE3-06, RPER3-06, RPEL1-10 | -30...+50 (-22...+122) | -30...+80 (-22...+176) | ± 10 |
| SD2E-B2/H, SD2E-B3/H, SD2E-B4/H, SD3E-B2/H, SD3E-C2/H | -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, E1G | E2 | E3A | E4A |
| 12 DC | 2.72 | 16211400 | 24156100 | 24159600 | 24159700 |
| | | C22B-01200E1-4.41NA | C22B-01200E2-4.41NA | C22B-01200E3A-4.41NA | C22B-01200E4A-4.41NA |
| 14 DC | 2.14 | 24158200 | 24930900 | 27662100 | 27662200 |
| | | C22B-01400E1-6.55NA | C22B-01400E2-6.55NA | C22B-01400E3A-6.55NA | C22B-01400E4A-6.55NA |
| 24 DC | 1.29 | 16211600 | 24157400 | 24159800 | 24159900 |
| | | C22B-02400E1-18.6NA | C22B-02400E2-18.6NA | C22B-02400E3A-18.6NA | C22B-02400E4A-18.6NA |
| 27 DC | 1.07 | 16211700 | 24157600 | 19744600 | 19744500 |
| | | C22B-02700E1-25.3NA | C22B-02700E2-25.3NA | C22B-02700E3A-25.3NA | C22B-02700E4A-25.3NA |
| 205 DC | 0.15 | 16211500 | not available | not available | not available |
| 230 AC 50 Hz | 0.15 | not available | not available | not available | 18849000 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 |
| 12 DC | 2.72 | 34007700 | 32489000 | 43962500 | on request |
| | | C22B-01200E1-4.41NB | C22B-01200E2-4.41NB | C22B-01200E3A-4.41NB | C22B-01200E4A-4.41NB |
| 24 DC | 1.29 | 24156800 | 32092900 | 24160200 | 24160300 |
| | | C22B-02400E1-18.6NB | C22B-02400E2-18.6NB | C22B-02400E3A-18.6NB | C22B-02400E4A-18.6NB |
| 27 DC | 1.07 | 33570600 | on request | 31802800 | 44646100 |
| | | C22B-02700E1-25.3NB | C22B-02700E3A-25.3NB | C22B-02700E4A-25.3NB | C22B-02700E5A-25.3NB |

| 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, E1G | E2 | E3A | E4A |
| 12 DC | 1.83 | 27222400 | 27222500 | 27222600 | 27222700 |
| | | C22B-01200E1-6.55NA | C22B-01200E2-6.55NA | C22B-01200E3A-6.55NA | C22B-01200E4A-6.55NA |
| 24 DC | 0.95 | 27222800 | 27222900 | 27223000 | 27223100 |
| | | C22B-02400E1-25.3NA | C22B-02400E2-25.3NA | C22B-02400E3A-25.3NA | C22B-02400E4A-25.3NA |
| 205 DC | 0.09 | 24160100 | not available | not available | not available |
| 230 AC 50 Hz | 0.09 | not available | not available | not available | 20004200 C22B-23050E5-2353NA |

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

| Surface treatment B: 520 h salt spray test acc. to ISO 9227 | | |
|---|-------------|---|
| Voltage [V] | Current [A] | Connector type |
| 12 DC | 1.83 | E12A 40310201 C22B-01200E12A-6,55NB on request |
| 24 DC | 0.95 | 30129500 C22B-02400E1-25,3NB on request |
| | | 33028000 C22B-02400E13A-25,3NB |

| 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 | E1G 24154300 C22A-01200E1G-4.41NAH not available |
| 24 DC | 1.29 | 24154400 C22A-02400E1G-18.6NAH not available |
| 115 AC 50 Hz | 0.30 | not available 24154500 C22A-11500E5-344NAH |
| 230 AC 50 Hz | 0.15 | not available 24154600 C22A-23050E5-1393NAH |

| RPEW4-06* | | |
|-------------|-------------|--|
| Voltage [V] | Current [A] | Typy konektorů |
| 12 DC | 2.64 | EW1 24154700 C22C-01200EW1-4.54NAH/M |
| 24 DC | 1.32 | 24154900 C22C-02400EW1-18.2NAH/M |
| 106 DC | 0.27 | 24155100 C22C-10600EW1-400NAH/M |

| 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 |
| 12 DC | 2.64 | EW1 16205100 C22C-01200EW1-4.54NA/M |
| 24 DC | 1.32 | 16205000 C22C-02400EW1-18.2NA/M |
| 106 DC | 0.27 | 16205200 C22C-10600EW1-400NA/M |

| RPEW4-06 with CSA certification | | |
|---|-------------|--|
| Surface treatment A: 240 h salt spray test acc. to ISO 9227 | | |
| Voltage [V] | Current [A] | Typy konektorů |
| 12 DC | 2.64 | EW2 24155500 C22C-01200EW2-4.54NAH/M |
| 24 DC | 1.32 | 24155300 C22C-02400EW2-18.2NAH/M |
| 106 DC | 0.27 | 24155100 C22C-10600EW1-400NAH/M |

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 | 31323800 C22B-01200E13A-5NA |
| | | 18838300 C22B-02400E1-13.4NA | 19696200 C22B-02400E12A-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 | on request |
| | | 34184200 C22B-02400E1-13.4NB | 40948200 C22B-02400E12A-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 | |
|-------------------|----------------------------------|----------------------------------|------|
| | | E1G | E13A |
| 12 DC max. 1,6 | 16187500 C22A-01200E1G-5.15NA | 16187500 C22A-01200E1G-5.15NA | |
| | | 16186800 C22A-02400E1G-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 |
| 12 DC | max. 2.5 | 18838500 | 19744700 | 19696100 |
| | | C22B-01200E1-2.33NA | C22B-01200E3A-2.33NA | on request |
| 24 DC | max. 1 | 18838300 | 19744300 | 19696200 |
| | | C22B-02400E1-13.4NA | C22B-02400E3A-13.4NA | C22B-02400E12A-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 |
| 12 DC | max. 2.5 | 34180800 | 43850600 | 40426100 |
| | | C22B-01200E1-2.33NB | C22B-01200E3A-2.33NB | C22B-01200E12A-2.33NB |
| 24 DC | max. 1 | 34184200 | 33288400 | 40948200 |
| | | C22B-02400E1-13.4NB | C22B-02400E3A-13.4NB | on request |

| 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 |
| 12 DC | max. 2.6 | 34180800 | 43850600 | 42752300 |
| | | C22B-01200E1-2.33NB | C22B-01200E3A-2.33NB | C22B-01200E4A-2.33NB |
| 24 DC | max. 1 | 43534000 | on request | 43498500 |
| | | C22B-02400E1-13.1NB | on request | C22B-02400E12A-13.1NB |

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

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

| RPE4-10 | | | | | | |
|--|-------------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|---|
| Surface treatment A: 240 h salt spray test acc. to ISO 9227 | | | | | | |
| Voltage [V] | Current [A] | Connector types | E2 | E3 | E4 | E5 |
| 12 DC | 3.17 | 16195700 C31A-01200E1-3.78FA | 276608010 C31A-01200E2-3.78FA | 16197001 C31A-01200E3-3.78FA | 16196901 C31A-01200E4-3.78FA | E12A 33252200 C31A-01200E12A-3.78FA |
| 14 DC | 2.98 | 16195900 C31A-01400E1-4.73FA | 27660900 C31A-01400E2-4.73FA | on request | on request | on request |
| 24 DC | 1.73 | 16196100 C31A-02400E1-13.9FA | 23896000 C31A-02400E2-13.9FA | 16197201 C31A-02400E3-13.9FA | 16197101 C31A-02400E4-13.9FA | 33252300 C31A-02400E12A-13.9FA |
| 27 DC | 1.52 | 16196300 C31A-02700E1-17.8FA | 27661000 C31A-02700E2-17.8FA | 27661301 C31A-02700E3-17.8FA | 27661401 C31A-02700E4-17.8FA | 33863900 C31A-02700E13A-17.8FA |
| 205 DC | 0.20 | 16196700 C31A-20500E1G-1027FA | not available | not available | not available | not available |
| 230 AC 50 Hz | 0.20 | not available | not available | not available | not available | 16195101 C31A-23050E5-1027FA |

| RPE4-10 | | | | | | |
|--|-------------|----------------------------------|---------------------------------|---------------------------------|---------------|-----------------------------------|
| Surface treatment B: 520 h salt spray test acc. to ISO 9227 | | | | | | |
| Voltage [V] | Current [A] | Connector types | E2 | E3 | E4 | E12A |
| 12 DC | 3.17 | 40135200 C31A-01200E1-3.78FB | on request | on request | on request | 41292600 C31A-01200E12A-3.78FB |
| 24 DC | 1.73 | 31648900 C31A-02400E1-13.9FB | 42422000 C31A-02400E2-13.9FB | 29427901 C31A-02400E3-13.9FB | on request | 41292600 C31A-02400E12A-13.9FB |
| 27 DC | 1.52 | 40167600 C31A-02700E1-17.8FB | not available | 31803101 C31A-02700E3-17.8FB | on request | on request |
| 205 DC | 0.20 | 34353800 C31A-20500E1G-1027FB | not available | not available | not available | not available |

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 |
|-----------------|---|---|--|

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 |
| 24 DC | 1.73 | EW1 |
| 106 DC | 0.38 | EW1 |

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 | 0.38 | EW1 |
| 60 Hz | | |

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 |
| 24 DC | max. 1,1 | E1 |

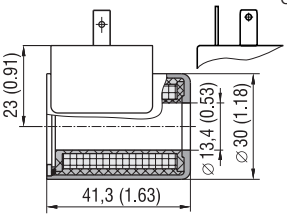
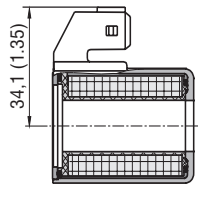
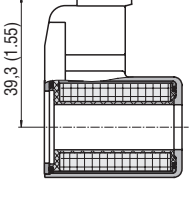
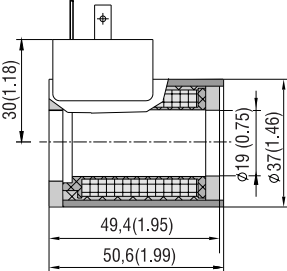
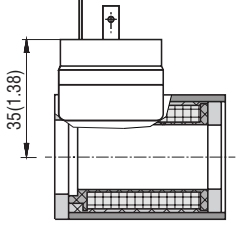
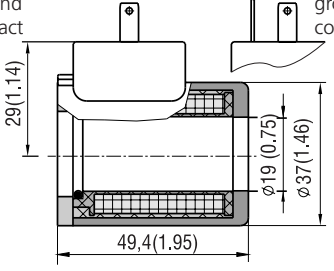
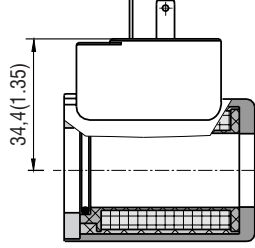
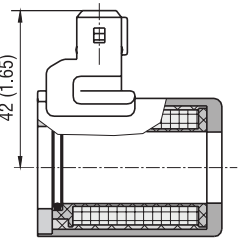
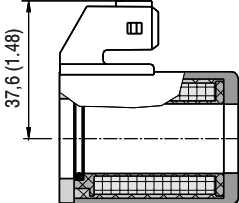
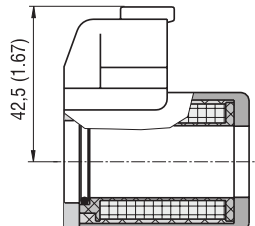
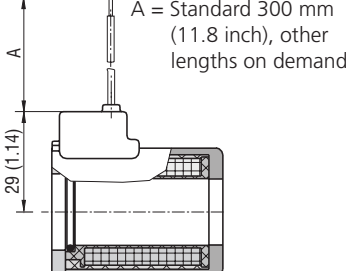
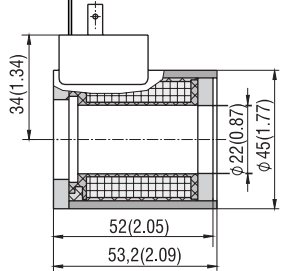
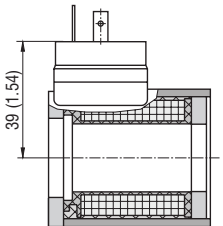
| Voltage [V] | Current [A] | Connector types |
|-------------|-------------|-----------------|
| 12 DC | max. 1,9 | E2 |
| 24 DC | max. 1,1 | E2 |

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

| Voltage [V] | Current [A] | Connector types |
|-------------|-------------|-----------------|
| 12 DC | max. 1,9 | E1 |
| 24 DC | max. 1,1 | E1 |

| Voltage [V] | Current [A] | Connector types |
|-------------|-------------|-----------------|
| 12 DC | max. 1,9 | E3 |
| 24 DC | max. 1,1 | E3 |

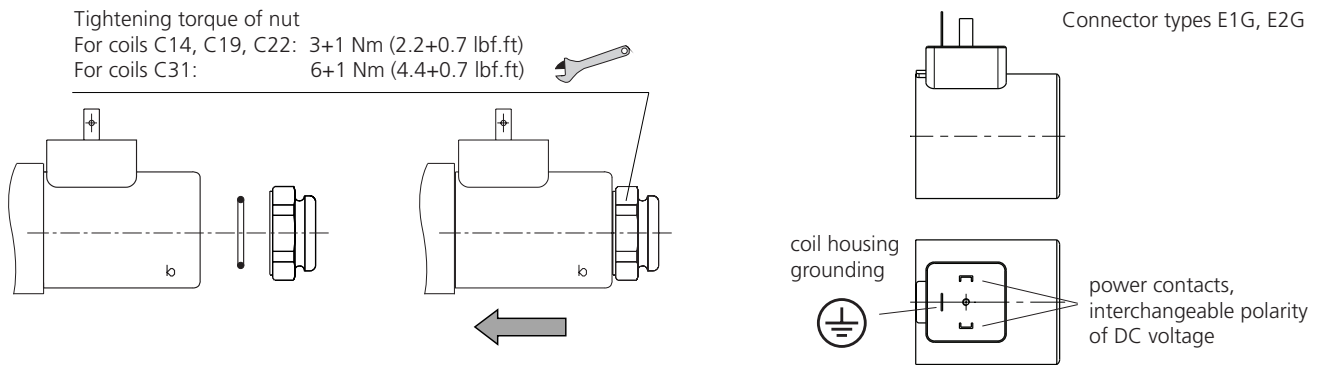
Dimensions in millimeters (inch)

| C14B | | | | | |
|---|---|---|---|---|-------------------------|
| E1, E2 | IP65 | E1G, E2G | E3A, E4A | IP67 | E12A, E13A IP67 / IP69K |
| without ground contact |  | with ground contact |  |  | |
| C19A | | | | | |
| E1G, E2G | IP65 | E5 | IP65 | | |
|  | |  | | | |
| C19B | | | | | |
| E1, E2, | IP65 | E1G, E2G | E5, E51 | IP65 | E3, E4 IP67 |
| without ground contact |  | with ground contact |  |  | |
| E3A, EA4 | IP67 | E12A, E13A | IP67 / IP69K | E8, E9 | |
|  |  |  | | | |
| C22A | | | | | |
| E1G, E2G | IP65 | E5 | IP65 | | |
|  |  | | | | |

Dimensions in millimeters (inch)

| C22B | | | | | |
|------------------------|--------------|---------------------|---------|--|---------------|
| E1, E2 | IP65 | E1G, E2G | E5, E51 | IP65 | E3A, E4A IP67 |
| without ground contact | | with ground contact | | | |
| | | | | | |
| E12A, E13A | IP67 / IP69K | E8, E9 | | A = Standard 300 mm (11.8 inch), other lengths on demand | |
| | | | | | |
| C22C | | | | | |
| EW1, EW2 | IP65 | | | | |
| | | | | | |
| C31A | | | | | |
| E1, E2 | IP65 | E1G, E2G | E5, E51 | IP65 | E3, E4 IP67 |
| without ground contact | | with ground contact | | | |
| | | | | | |
| 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.