

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	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	HA 0060	products and general conditions			
Connectors	HA 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.

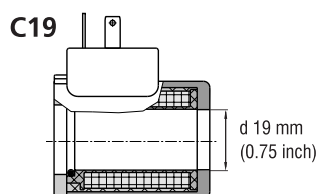
Quick disconnect

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:



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



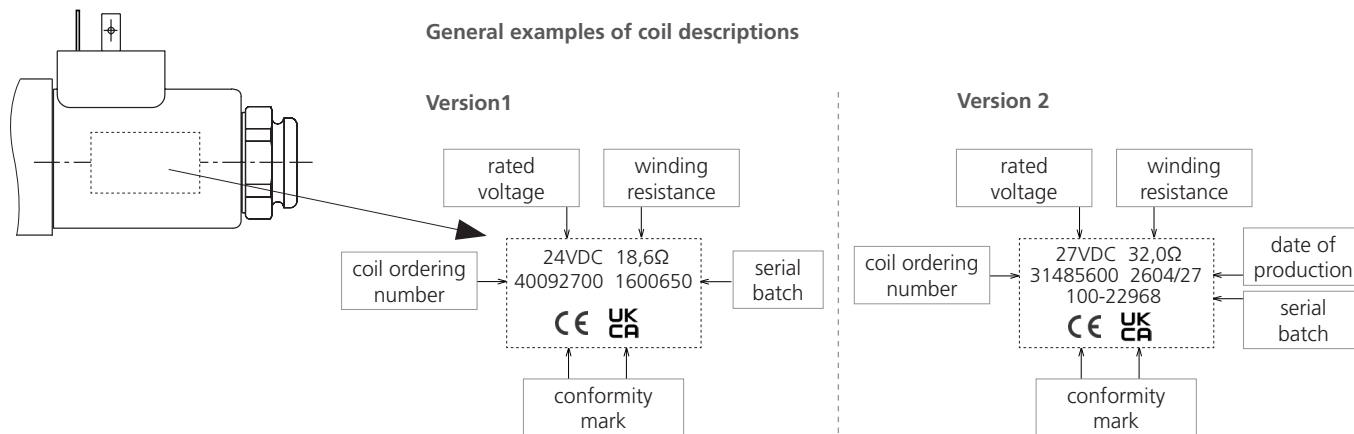
Connector EW



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

Ordering Code	4
Coils C14B (d = 13.4 mm (0.53 inch)).....	5
RPEK1-03, RPEL1-04	5
SD2E-A2/L, SD2E-A3/L, SD2E-A4/L, SD3E-A2/L	5
SP4P1-B4, SD3P-A2	5
Coils C19 (d = 19 mm (0.75 inch)).....	6
RPE2-04, RPE3-04, RPEL2-06, ROE3-04, ROE3-06, SR1E2-A2, SR4E2-B2, SR4E2-C2, 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 proportional directional control valve without integrated electronics unit	8
PRM2-04, PRM7-04 proportional directional control valve with integrated electronics	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
Coils C22 (d = 22 mm (0.87 inch)).....	10
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
Coils C31 (d = 31 mm (1.22 inch)).....	14
RPE4-10	14
RPEW4-10, RPEW4-10 with CSA certification	15
PRM6-10, PRM7-10	15
Dimensions in millimeters (inch)	16
Mounting / dismantling the coils	18

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Solenoid coil										Special coil design
Coil size										Type of insulating material
inner diameter of coil										standard
Ø 13.4 mm (0.53 in)	14									H
Ø 19.0 mm (0.75 in)	19									for valves with CSA certification
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
drawn housing	B									zinc coated, 240 h salt spray test acc. to ISO 9227
long drawn housing	C									B
										zinc coated, 520 h salt spray test acc. to ISO 9227
Rated voltage (on the coil terminals)										Coil detent type (for type C31 only)
12 V DC	01200									N
14 V DC	01400									F
24 V DC	02400									without detent
27 V DC	02700									with detent (by pin)
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) ± 7 %
see the table										
										Length of loose conductors
										standard length 300 mm (11.8 in)
										other length in mm (in)
										Additional protection of conductors (only for loose conductors)
										non-braided
										braided

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

Note explaining usage of coils:

Coils with supply voltage 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))

RPEK1-03, RPEL1-04 SD2E-A2/L, SD2E-A3/L, SD2E-A4/L, SD3E-A2/L			
		→	→
		→	→

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

Voltage		Current		Connector types		Ambient temperature °C (°F)		Fluid temperature °C (°F)		Supply voltage tolerance % of U _N	
[V]	[A]	E1	E2	E3A	E4A	E12A	E13A				
12 DC	1.83	16210300 C14B-01200E1-6.55NA	24101600 C14B-01200E2-6.55NA	28822500 C14B-01200E3A-6.55NA	28822600 C14B-01200E4A-6.55NA	29268200 C14B-01200E12A-6.55NA	29268800 C14B-01200E13A-6.55NA	-30 ... +50 (-22 ... +122)	-30 ... +80 (-22 ... +176)	±10	
14 DC	1.57	24102200 C14B-01400E1-8.91NA	on request	41194600 C14B-01400E3A-8.91NA	40291000 C14B-01400E4A-8.91NA	34948600 C14B-01400E12A-8.91NA	40498900 C14B-01400E13A-8.91NA	-30 ... +50 (-22 ... +122)	-30 ... +60 (-22 ... +140)	±10	
24 DC	0.92	16210400 C14B-02400E1-26.2NA	24101800 C14B-02400E2-26.2NA	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	on request	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		Current		Connector types		Ambient temperature °C (°F)		Fluid temperature °C (°F)		Supply voltage tolerance % of U _N	
[V]	[A]	E1	E2	E3A	E4A	E12A	E13A				
12 DC	1.83	42978200 C14B-01200E1-6.55NB	44465700 C14B-01200E2-6.55NB	on request	on request	32700900 C14B-01200E12A-6.55NB	on request	-30 ... +90 (-22 ... +194)	-30 ... +80 (-22 ... +176)	±10	
14 DC	1.57	on request	on request	on request	on request	34440200 C14B-01400E12A-8.91NB	on request	-30 ... +90 (-22 ... +194)	-30 ... +80 (-22 ... +176)	±10	
24 DC	0.92	33469800 C14B-02400E1-26.2NB	on request	41702200 C14B-02400E3A-26.2NB	on request	31145400 C14B-02400E12A-26.2NB	31145500 C14B-02400E13A-26.2NB				

SP4P1-B4

→	→	→	→
→	→	→	→

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

Voltage		Current		Connector types		Ambient temperature °C (°F)		Fluid temperature °C (°F)		Supply voltage tolerance % of U _N	
[V]	[A]	E3A	E12A	E13A							
12 DC	max. 0.7	33038300 C14B-01200E3A-7.8NA	32482500 C14B-01200E12A-7.8NA	437442 C14B-02400E13A-29.5NA				-30 ... +80 (-22 ... +176)	-30 ... +80 (-22 ... +176)	±10	
24 DC	max 0.35	33038400 C14B-02400E3A-29.5NA	32482400 C14B-02400E12A-29.5NA								

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

Voltage		Current		Connector types		Ambient temperature °C (°F)		Fluid temperature °C (°F)		Supply voltage tolerance % of U _N	
[V]	[A]	E3A	E12A								
12 DC	max. 0.7	on request	40933100 C14B-01200E12A-7.8NB					-30 ... +80 (-22 ... +176)	-30 ... +80 (-22 ... +176)	±10	
24 DC	max 0.35	on request	34186400 C14B-02400E12A-29.5NB								

SD3P-A2/H

→	→	→	→
→	→	→	→

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

Voltage		Current		Connector types		Ambient temperature °C (°F)		Fluid temperature °C (°F)		Supply voltage tolerance % of U _N	
[V]	[A]	E1	E2	E3A	E12A	E13A					
12 DC	max. 0.950	42978200 C14B-01200E1-6.55NB	44465700 C14B-01200E2-6.55NB	on request	32700900 C14B-01200E12A-6.55NB	on request		-30 ... +80 (-22 ... +176)	-30 ... +80 (-22 ... +176)	±10	
24 DC	max. 0.475	33469800 C14B-02400E1-26.2NB	on request	41702200 C14B-02400E3A-26.2NB	31145400 C14B-02400E12A-26.2NB	31145500 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
SD2E-B2/L, SD2E-B3/L, SD2E-B4/L, SD3E-B2/L	→ -30...+50 (-22...+122)	-30...+60 (-22...+140)	±10
RPE2-04, RPE3-04, RPE12-06, ROE3-04, ROE3-06, SR1E2-A2, SR4E2-B2, SR4E2-C2, SP4E1-B3	→ -30...+50 (-22...+122)	-30...+80 (-22...+176)	±10
SD2E-A2/H, SD2E-A3/H, SD2E-A4/Hx, SD3E-A2/H, SD1E-A2, SD1E-A3	→ -30...+50 (-22...+122)	-30...+80 (-22...+176)	±10

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

[illegible]

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

Voltage Current Connector types									
Voltage [V]	Current [A]	E1	E2	E3	E3A	E4A	E12A	E13A	
12 DC	2.45	40134900 C198-01200E1-4.9NB	on request	42999500 C198-01200E3-4.9NB	on request	43486900 C198-01200E4A-4.9NB	40317600 C198-01200E12A-4.9NB	43930600 C198-01200E13A-4.9NB	
14 DC	1.70	43106200 C198-01400E1-8.23NB	on request	on request	on request	on request	33212800 C198-01400E12A-8.23NB	on request	
24 DC	1.15	28829600 C198-02400E1-20.8NB	32092500 C198-02400E2-20.8NB	on request	44017500 C198-02400E3A-20.8NB	43191500 C198-02400E4A-20.8NB	40384800 C198-02400E12A-20.8NB	31330200 C198-02400E13A-20.8NB	
27 DC	0.89	41176700 C198-02700E1-30.4NB	on request		33559000 C198-02700E3A-30.4NB	on request	on request	40052200 C198-02700E13A-30.4NB	

RPE3-04 with CSA certification

Surface treatment A: 240 h salt spray test acc. to ISO 9227			
Voltage	Current	Connector types	
[V]	[A]	E1	
12 DC	2.41	24140700	
		C 19A-01200E1-4.98NAH	
24 DC	1.15	24140800	
		C 19A-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		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 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	not available

V [V]	A [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	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	

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	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))

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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	E3A	E12A	E13A
12 DC	max. 1.7	27821900 C19B-01200E1-4.68NA	on request	27822000 C19B-01200E3-4.68NA	27785600 C19B-01200E4-4.68NA	27785600 C19B-01200E4-4.68NA	31688600 C19B-01200E3A-4.68NA	27821200 C19B-01200E12A-4.68NA	on request
24 DC	max. 0.8	27824200 C19B-02400E1-20.6NA	27824300 C19B-02400E2-20.6NA	28145200 C19B-02400E3-20.6NA	27824400 C19B-02400E4-20.6NA	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	E1	E2	E3	E3A	E12A	E13A
24 DC	max. 0.8	40406400 C19B-02400E1-20.6NB	43664000 C19B-02400E2-20.6NB	31805200 C19B-02400E3-20.6NB	42284300 C19B-02400E3A-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	E1	E2	E3	E4
12 DC	max. 1.7	16186100 C19A-01200E1-4.98NA	16191600 C19A-01200E2-4.98NA	16191100 C19A-01200E3-4.98NA	16191300 C19A-01200E4-4.98NA	16191300 C19A-01200E4-4.98NA
24 DC	max. 0.8	16186200 C19A-02400E1-21NA	16191700 C19A-02400E2-21NA	16191200 C19A-02400E3-21NA	16191400 C19A-02400E4-21NA	16191400 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	E3A	E12A	E13A
12 DC	max. 1	28145500 C19B-01200E1-6.5NA	28145600 C19B-01200E2-6.5NA	28145700 C19B-01200E3-6.5NA	28145800 C19B-01200E4-6.5NA	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	27824200 C19B-02400E1-20.6NA	27824300 C19B-02400E2-20.6NA	28145200 C19B-02400E3-20.6NA	27824400 C19B-02400E4-20.6NA	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))

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	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

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

Max. reduced pressure 20 bar (290 PSI)

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]	Steckertypen	E1	E3	E3A	E4	E12A	E13A
12 DC	max. 1.5		27821900 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	E1	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	E1	E2	E3	E3A	E4	E12A	E13A
24 DC	max. 0.75		27824200 C19B-02400E1-20.6NA	27824300 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	E1	E2	E3	E3A	E12A	E13A
24 DC	max. 0.75		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

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	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	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	E12A	E13A
12 DC	1.83	27222400 C22B-01200E1-6.55NA	27222500 C22B-01200E2-6.55NA	27222600 C22B-01200E3A-6.55NA	27222700 C22B-01200E4A-6.55NA	not available	not available	18815601 C22B-01200E12A-6.55NA	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	not available	not available	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	not available	not available	not available
230 AC 50 Hz	0.09	not available	not available	not available	not available	not available	20004200 C22B-23050E5-2353NA	not available	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
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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
24 DC	max. 1	18838300 C22B-02400E1-13.4NA	19744300 C22B-02400E3A-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
24 DC	max. 1	34184200 C22B-02400E1-13.4NB	33288400 C22B-02400E3A-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)
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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
12 DC	max. 1.6	16187500 C22A-01200E1-5.15NA	
24 DC	max. 1	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
12 DC	max. 2.5	18838500 C22B-01200E1-2.33NA	19744700 C22B-01200E3A-2.33NA
		18838300 C22B-02400E1-13.4NA	19744300 C22B-02400E3A-13.4NA
24 DC	max. 1		40755800 C22B-02400E4A-13.4NA
			19696200 C22B-02400E12A-13.4NA
			19696100 C22B-01200E12A-2.33NA
			19909300 C22B-01200E13A-2.33NA
			30691600 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
12 DC	max. 2.5	34180800 C22B-01200E1-2.33NB	43850600 C22B-01200E3A-2.33NB
		34184200 C22B-02400E1-13.4NB	33288400 C22B-02400E3A-13.4NB
24 DC	max. 1		40948200 C22B-02400E12A-13.4NB
			28811200 C22B-02400E13A-13.4NB
			40426100 C22B-01200E12A-2.33NB
			on request C22B-01200E4A-2.33NB
			E12A
			E13A

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
12 DC	max. 2.6	34180800 C22B-01200E1-2.33NB	43850600 C22B-01200E3A-2.33NB
		43534000 C22B-02400E1-13.1NB	on request C22B-02400E12A-13.1NB
24 DC	max. 1		43498500 C22B-02400E12A-13.1NB
			on request C22B-02400E13A-13.1NB
			40426100 C22B-01200E12A-2.33NB
			on request C22B-01200E4A-2.33NB
			E12A
			E13A

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	E12A	E13A	
12 DC	3.26	16195700 C31A-01200E1-3.68FA	27660800 C31A-01200E2-3.68FA	16197001 C31A-01200E3-3.68FA	16196901 C31A-01200E4-3.68FA	not available	33252200 C31A-01200E12A-3.68FA	on request	
14 DC	2.98	16195900 C31A-01400E1-4.73FA	27660900 C31A-01400E2-4.73FA	on request	on request	not available	on request	on request	
24 DC	1.78	16196100 C31A-02400E1-13.5FA	23896000 C31A-02400E2-13.5FA	16197201 C31A-02400E3-13.5FA	16197101 C31A-02400E4-13.5FA	not available	33252300 C31A-02400E12A-13.5FA	34234400 C31A-02400E13A-13.5FA	
27 DC	1.52	16196300 C31A-02700E1-17.8FA	27661000 C31A-02700E2-17.8FA	27661301 C31A-02700E3-17.8FA	27661401 C31A-02700E4-17.8FA	not available	on request	33863900 C31A-02700E13A-17.8FA	
205 DC	0.20	16196700 C31A-20500E1-1027FA	not available	not available	not available	not available	not available	not available	
230 AC 50 Hz	0.20	not available	not available	not available	not available	16195101 C31A-23050E5-1027FA	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	E12A		
12 DC	3.26	40135200 C31A-01200E1-3.68FB	on request	on request	on request	41292600 C31A-01200E12A-3.68FB	on request		
24 DC	1.78	31648900 C31A-02400E1-13.5FB	42422000 C31A-02400E2-13.5FB	29427901 C31A-02400E3-13.5FB	on request	41292600 C31A-02400E12A-13.5FB	44969200 C31A-02400E13A-13.5FB		
27 DC	1.52	40167600 C31A-02700E1-17.8FB	not available	31803101 C31A-02700E3-17.8FB	on request	on request	on request		
205 DC	0.20	34353800 C31A-20500E1-1027FB	not available	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
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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	24172000 C31A-01200EW1-3.68FA/M	
24 DC	1.78	24172200 C31A-02400EW1-13.5FA/M	
106 DC	0.42	24172400 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	24172600 C31A-10600EW1-252FAH/M	

PRM6-10, PRM7-10	→	Ambient temperature °C (°F) 30 ...+50 (-22 ...+122)	Fluid temperature °C (°F) -30 ...+80 (-22...+176)
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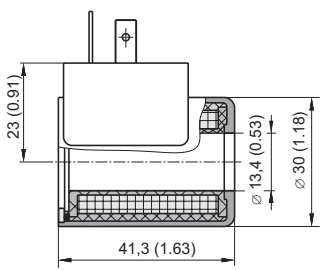
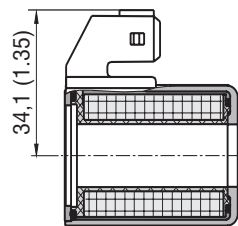
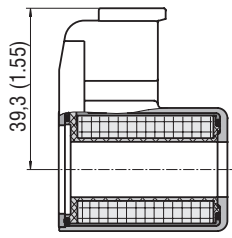
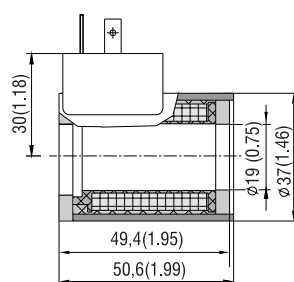
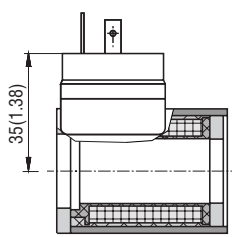
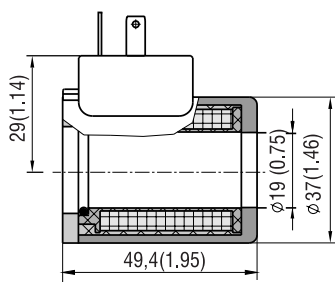
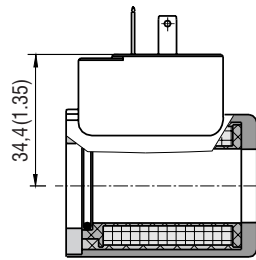
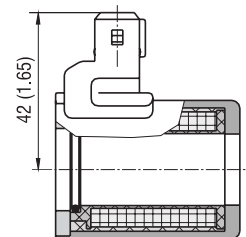
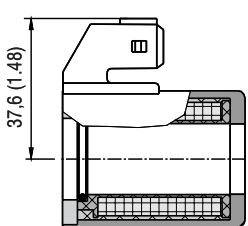
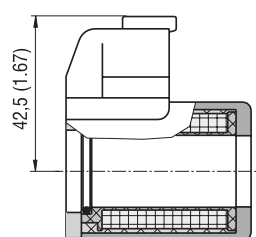
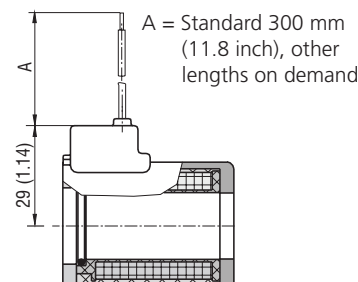
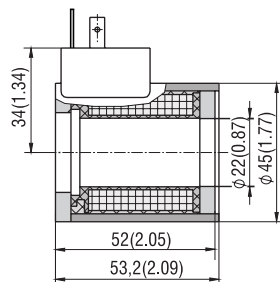
Surface treatment A: 240 h salt spray test acc. to ISO 9227			
Voltage [V]	Current [A]	Connector types	
12 DC	max. 1.9	16195800 C31A-01200E1-4.73FA	on request
24 DC	max. 1.1	16196100 C31A-02400E1-13.5FA	23896000 C31A-02400E2-13.5FA

Voltage [V]	Current [A]	Connector types	
12 DC	max. 1.9	33223901 C31A-01200E3-4.73FA	32877000 C31A-01200E13A-4.73FA
24 DC	max. 1.1	16197201 C31A-02400E3-13.5FA	34234400 C31A-02400E13A-13.5FA

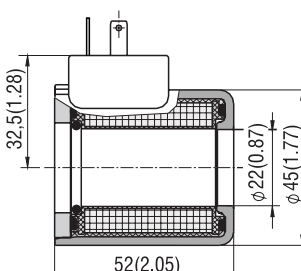
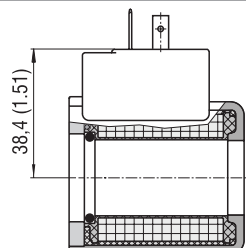
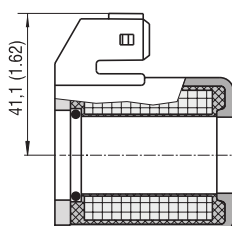
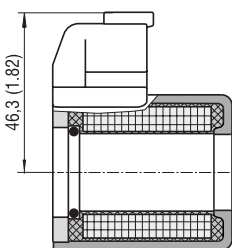
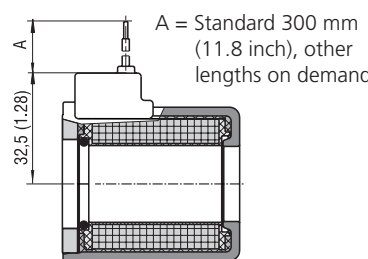
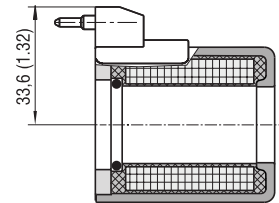
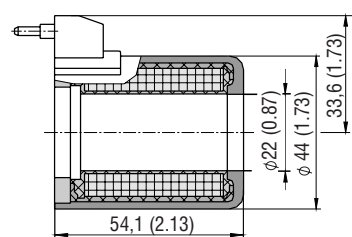
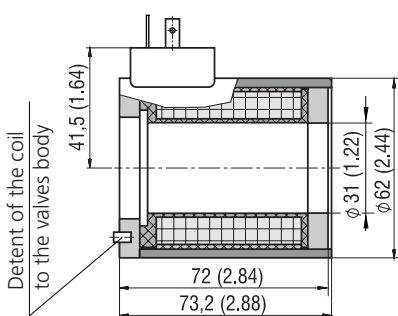
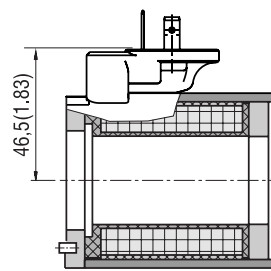
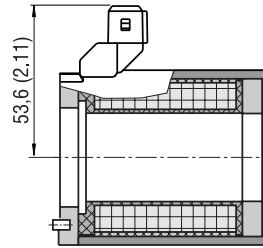
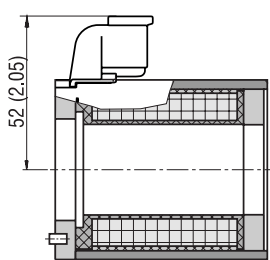
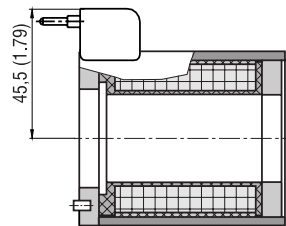
Surface treatment B: 520 h salt spray test acc. to ISO 9227			
Voltage [V]	Current [A]	Connector types	
12 DC	max. 1.9	31648900 C31A-02400E1-13.5FB	42422000 C31A-02400E2-13.5FB
24 DC	max. 1.1	29427901 C31A-02400E3-13.5FB	33081100 C31A-02400E4-13.5FB

Voltage [V]	Current [A]	Connector types	
12 DC	max. 1.9	33081100 C31A-02400E4-13.5FB	33267000 C31A-02400E12A-13.5FB
24 DC	max. 1.1	33081100 C31A-02400E4-13.5FB	33267000 C31A-02400E12A-13.5FB

Dimensions in millimeters (inch)

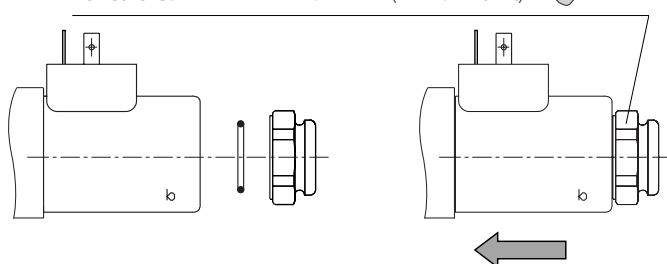
C14B					
E1, E2		IP65	E3A, E4A		IP65 / IP67
					
					
C19A					
E1, E2		IP65	E5		IP65
					
C19B					
E1, E2		IP65	E5, E51		IP65
					
					
E3A, EA4		IP65 / IP67	E12A, E13A		IP67 / IP69K
					
					
C22A					
E1, E2		IP65			
					
			The following generally applies:  The specified IP rating applies only in the case of correctly connected connectors (male + female) with the corresponding IP rating.		

Dimensions in millimeters (inch)

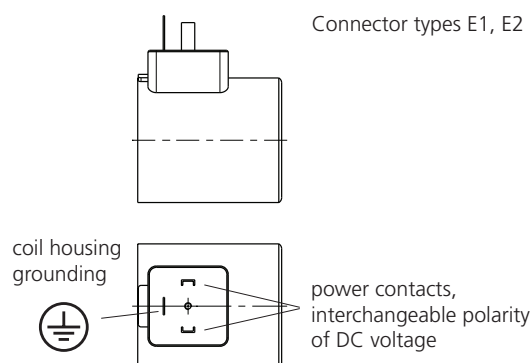
C22B					
E1, E2 IP65		E5, E51 IP65		E3A , E4A IP65 / IP67	
					
E12A , E13A IP67 / IP69K		E8, E9		EW1, EW2 IP65	
					
C22C					
EW1, EW2 IP65					
					
C31A					
E1, E2 IP65		E5, E51 IP65		E3, E4 IP65 / IP67	
					
E12A , E13A IP67 / IP69K		EW1 IP65			
					
				The following generally applies:  The specified IP rating applies only in the case of correctly connected connectors (male + female) with the corresponding IP rating.	

Mounting / dismantling the coils

Tightening torque of nut
For coils C14, C19, C22: 3+1 Nm (2.2+0.7 lbf.ft)
For coils C31: 6+1 Nm (4.4+0.7 lbf.ft)



Connector types E1, E2



- › 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.