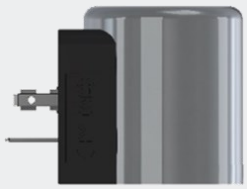
HYDAC INTERNATIONAL

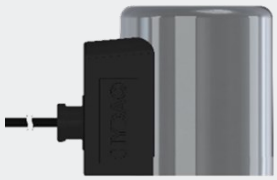
CONNECTION TYPES

G



K

L



N

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U

Solenoid coils for directional valves

for electromagnetic actuation

Direct current (DC) and alternating current (AC)

PRODUCT ADVANTAGES

- **Maximum force with minimum space requirements**
  thanks to layer-wound coil with maximum copper insertion and minimum space requirement. Prevents damage to the wire insulation (avoids short circuits)
- **Fully encapsulated coil**
  with internal coil seal prevents penetration of moisture to prevent short-circuits in the coil
- **Designed for 100% duty cycle**
- **Low energy consumption**
  thanks to optimised design of the force/energy ratio
- **High mechanical resistance and corrosion protection**
  thanks to zinc-nickel coated steel casing
- **High thermal load capacity**
  up to insulation class H (180 °C)
- **7 different electrical connection types as standard, with protection classes IP65, IP67 or IP69**
- **Any mounting position**
  due to symmetrical coil design
- **Extensive range of coils with UL approval**
  certified according to UL94 with Flame Rating V-0

CONTENTS

TECHNICAL CHARACTERISTICS

Duty cycle	100 % (S1) up to max. 115 % of the nominal voltage for sizes 1329 and 1836 max. 110 % of the nominal voltage for sizes 2345 and 3164 at max. 60 °C* ambient temperature
Coil (according to DIN VDE 0580)	Insulation class H for sizes 1329 and 1836 insulation class F for sizes 2345 and 3164
Max. permitted coil temperature	180 °C for sizes 1329 and 1836 155 °C for sizes 2345 and 3164
Surface temperature of the coil at 100 % duty cycle	>100 °C for sizes 1329, 1836, 2345 and 3164
Ambient temperature range*:	-30 °C to +60 °C for sizes 1329, 1836 and 2345 -30 °C to +50 °C for size 3164 The specifications in the valve brochure must also be observed.
Coil casing	Steel, ZnNi coating
Connector socket	Polyamide, black

*This value applies to a screw-in cartridge valve installed in a standard pipe connection housing. The max. ambient temperature range can be extended to +80 °C if appropriate heat dissipation is implemented to restrict the surface temperature of the coil casing to max. 100 °C during operation. In the application, the heat dissipation must be maintained at all times during valve operation, for example by means of convection or by passing operating fluid through the control manifold. For more information, see brochure 53.000, “Operating conditions and instructions for valves”.

Note
All technical characteristics relate to a coil mounted on the valve.

MODEL CODE

The model code serves to provide an overview. For available types, see table "Available coils“, page 3 onwards.

Coil 12 DN 01 - 40-1836 __

Designation

Nominal voltage

12	= 12 V DC
24	= 24 V AC/DC
48	= 48 V AC/DC
110	= 110 V AC (connection type G)
230	= 230 V AC (connection type G)

Further versions, page 3 onwards, and on request.

Voltage type

A	= Alternating current (AC)
D	= Direct current (DC)

Connection type		Poles	Connection	Protection class
G	= Plug A/B acc. to DIN EN 175301-803	3-pole	radial	IP65
K	= KOSTAL plug connector M27x1	2-pole	radial	IP65 / IP67
L	= 2 flying leads 0.75 mm² x 457 mm (18")	2-pole	radial	IP65 / IP67
N	= DEUTSCH plug connector DT04-2P	2-pole	axial	IP67 / IP69
O	= M12 plug connector	4-pole	radial	IP65
T	= AMP Junior Timer	2-pole	radial	IP65 / IP67
U	= AMP Junior Timer	2-pole	axial	IP65 / IP67

Further versions on request.

Variant (dependent on connection type)

N/A	= Standard
01	= Bidirectional suppressor diode for connection type DN, DT, DU (see p. 10)
02	= Additional cable lengths for connection type L (02, 03, etc.)

Size	Coil length		Inside Ø	Outside Ø	Weight
32-1329	= 32 mm	-	13 mm	29 mm	0.10 kg
40-1836	= 40 mm	-	18 mm	36 mm	0.19 kg
50-1836	= 50 mm	-	18 mm	36 mm	0.24 kg
50-2345	= 50 mm	-	23 mm	45 mm	0.35 kg
75-3164	= 75 mm	-	31 mm	64 mm	1.00 kg

Optional specifications

-S	= with O-ring to seal the coil on industrial valve housings in size 6
UL V0	= UL certification of coils with flame rating V-0 according to UL94

Note
Specification of protection class in accordance with EN 60529 applies to suitable and correctly mounted cable socket.

DESCRIPTION

The solenoid coil is generally manufactured as a direct current (DC) coil. Solenoid coils in version A for operation with alternating current (AC) have an integrated bridge rectifier.

In addition, solenoid coils with integrated bidirectional suppressor diodes are available on page 10 that serve to provide protection from voltage peaks and to reduce the switch-off induction voltage. For this purpose, the high-quality TVS diode P4KE68CA is installed.
In general, special coils are available on customer request - please contact your responsible sales partner.

Coils for proportional valves can be found in our separate brochure.

CONNECTION PLUG / ENERGY SAVING

For coils of connection type G with design in acc. with DIN EN 175301-803 , a cable socket for DC and AC coils is available under part no. 394287.
The LRS2 power reduction plug connector (part no. 4747017) is used to save energy with DC coils by reducing the power when the hold position has been reached.

To fulfil the protection class (IP code) in acc. with DIN EN 60529, the coil must be mounted on the valve correctly and a plug connector of the corresponding protection class must be used.

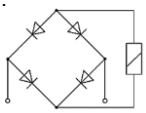
AVAILABLE COILS

CONNECTION TYPE G — IP65

ALTERNATING CURRENT (AC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
40-1836	24	18	24.8	-	3003122
	48	19	95	-	3301143
	115	20	500	-	3003156
	230	20	2137	-	3002594
50-1836	24	25	18	-	3091593
	48	25	73	-	3019734
	110	25	383	-	3019735
	230	25	1680	-	3019736
50-2345	110	30	288	-	4224861
	110 -S	30	288	-	4244174
	120 -S	30	372	-	4348779
	230	30	1285	-	4224863
	230 -S	30	1285	-	4244276
75-3164	110	38	242.5	-	4384591
	120	45	242.5	-	
	230	38	1106	-	4407514

Note
Rectifier integrated into coil socket. Design as bridge rectifier:



CONNECTION TYPE G — IP65

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
32-1329	12 UL V0[1]	11.8	12.2	0.984	2610160
	20 UL V0[1]	11.8	33.8	0.594	2611288
	24 UL V0[1]	11.8	48.7	0.493	2610161
	26	11.8	57.3	0.454	3709203
	205	11.3	3700	0.055	2610159
40-1836	10	18	5.4	1.852	3003128
	12	18	8	1.5	3000489
	12 UL V0[1]	18	8	1.5	3399930
	24	19	30	0.8	3000249
	24 UL V0[1]	19	30	0.8	3399932
	26	19.3	35	0.743	3614877
	28	19	41	0.683	3104545
	36	20	65	0.554	3003151
	48	20	116	0.414	3003155
	110	20	607	0.181	3003142
	125	19.5	800	0.156	3401209
	205	20	2137	0.096	3173182
	220	20	2350	0.094	3529173
50-1836	12	26.7	5.4	2.222	915151
	12 UL V0[1]	26.7	5.4	2.222	3401711
	20	26	15.5	1.290	3874682
	24	27.2	21.2	1.132	915142
	24 UL V0[1]	27.2	21.2	1.132	3401712
	26	26.6	25.4	1.024	3614878
	28	27	29	0.966	3504099
	48	26	89	0.539	3091591
	110	26	467	0.236	3091592
	125	26	600	0.208	3400879
	220	24	2000	0.11	3529174
50-2345	12	30	5.2	2.308	3274860
	12 -S	30	5.2	2.308	4244169
	12 UL V0[1]	30	5.2	2.308	3401761
	24	30	19.2	1.25	3274861
	24 -S	8	68.5	0.350	4277864
		30	19.2	1.25	4244171
	24 UL V0[1]	30	19.2	1.25	3401763
	28	30	26.1	1.073	4093484
	48	30	76.8	0.625	4375720
	96	32	288	0.333	4224852
	96 -S	32	288	0.333	4244173
	110 -S	32	372	0.296	4330790
	205	33	1285	0.160	4224854
	205 -S	33	1285	0.160	4244275
	220 -S	32	1489	0.148	4386106
75-3164	12	38	3.8	3.166	4251228
	24	38	15.2	1.583	4251230
	96	38	243	0.396	4251232
	110	38	318	0.345	4251233
	125	38	411	0.304	4251234
	205	38	1106	0.185	4251255
	220	38	1274	0.173	4251257

[1]UL certification of coils with flame rating V-0 in accordance with UL94.

CONNECTION TYPE K — IP65/IP67

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
40-1836	10	18	5.4	1.852	3003125
	12	18	8	1.5	3003133
	24	19	30	0.8	3003138
	28	19	41.7	0.671	3794789
	36	20	65	0.554	3003148
	48	20	116	0.414	3003153
50-1836	24	27	21	1.143	3091681
	28	27	29	0.966	3830428
50-2345	12 -S	30	5.2	2.308	4639056
	24 -S	30	19.2	1.25	4639055
	28 -S	32	26.1	1.073	4638924

CONNECTION TYPE L — IP65/IP67

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
32-1329	12 UL V0[1]	11.8	12.2	0.984	2610151
	24 UL V0[1]	11.8	48.7	0.493	2610162
40-1836	12	18	8	1.5	3002244
	24	19	30	0.8	3003119
	28	19	41	0.683	3263948
	36	20	65	0.554	3003140
	48	20	116	0.414	3003149
50-1836	10	26	3.8	2.632	3112950
	12	27	5.4	2.222	3091633
	24	27	21	1.143	3112951
	36	27	48.5	0.742	3112952
	48	26	89	0.539	3112953
50-2345	12	22	6.6	1.818	4288257
	24	22	26.1	0.920	3488338
	36	22	58.8	0.612	3538813

[1]UL certification of coils with flame rating V-0 in accordance with UL94.

CONNECTION TYPE N — IP67/IP69

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
32-1329	10 UL V0[1]	12	8.3	1.205	2610947
	12 UL V0[1]	11.8	12.2	0.984	2610149
	20 UL V0[1]	11.8	33.8	0.594	2610973
	24 UL V0[1]	11.8	48.7	0.493	2610150
40-1836	10	18	5.4	1.852	3012601
	12	18	8	1.5	3012600
	12 UL V0[1]	18	8	1.5	3426653
	20	19	21	0.952	3277546
	24	19	30	0.8	3012599
	24 UL V0[1]	19	30	0.8	3426654
	28	19	41	0.683	4479654
	36	20	65	0.554	3012602
	48	20	116	0.414	3012603
50-1836	10	26	3.8	2.632	3091664
	12	27	5.4	2.222	3091665
	12 UL V0[1]	27	5.4	2.222	3426780
	20	26	15.5	1.290	3277570
	24	27	21	1.143	3091667
	24 UL V0[1]	27	21	1.143	3426781
	28	27	29	0.966	3910046
	36	27	48.5	0.742	3091669
	48	26	89	0.539	3091670
50-2345	12	30	5.2	2.308	3241892
	12 -S	28	5.1	2.353	4244170
	24	30	19.2	1.25	3241893
	24 -S	32	18	1.333	4244172
	24 -S	9	64.1	0.374	4290983
	28	32	24.5	1.143	4118636
75-3164	12	38	15.16	1.58	4360072
	24	38	3.79	3.17	4360073

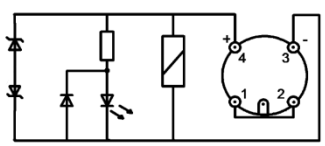
[1]UL certification of coils with flame rating V-0 in accordance with UL94.

CONNECTION TYPE O — IP65

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
40-1836	12	18	8	1.5	4501730
	24	19	30	0.8	3030064
	24	8	72	0.333	3131960
50-1836	24	27	21	1.143	3214337
50-2345	12 -S	30	4.8	2.5	4250874
	12 -S	8	18.18	0.66	4253622
	24 -S	30	19.2	1.25	4250885
	24 -S	8	68.57	0.35	4250889

Circuit diagram:



CONNECTION TYPE T — IP65/IP67

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
32-1329	12	11.8	12.2	0.984	3576908
40-1836	10	18	5.4	1.852	3008291
	12	18	8	1.5	3008275
	12 UL V0[1]	18	8	1.5	3426667
	20	19	21	0.952	3517698
	24	19	30	0.8	3008279
	24 UL V0[1]	19	30	0.8	3426669
	28	19	41	0.683	3245522
	36	20	65	0.554	3008283
	48	20	116	0.414	3008287
50-1836	12	27	5.4	2.222	3001033
	24	27	21	1.143	3001503
	48	26	89	0.54	3001507
75-3164	12	38	3.79	3.166	4327603
	24	38	15.16	1.583	4327604

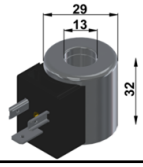
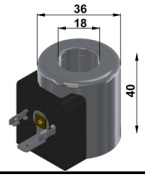
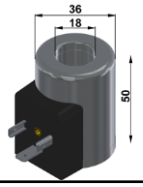
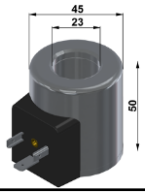
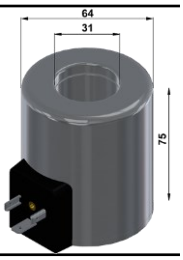
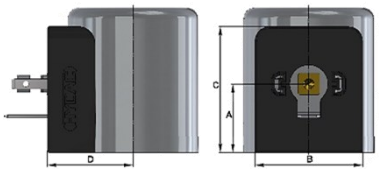
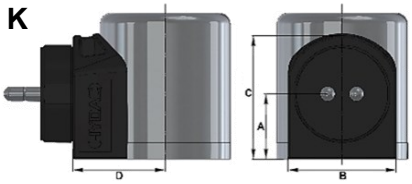
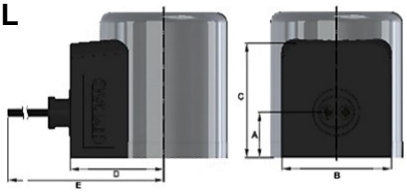
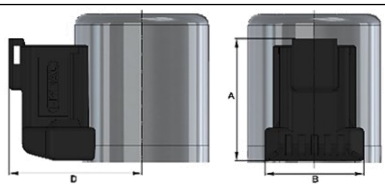
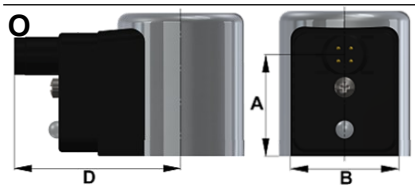
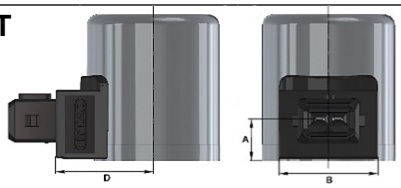
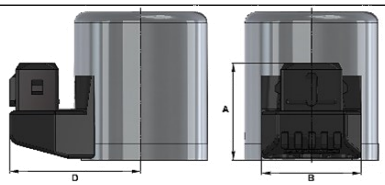
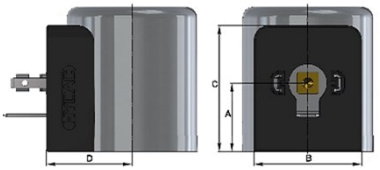
[1]UL certification of coils with flame rating V-0 in accordance with UL94.

CONNECTION TYPE U — IP65/IP67

DIRECT CURRENT (DC)

Size	Voltage U [V]	Power $P_{Nom\ 20}$ [W]	Resistance R_{20} [Ω]	Current I_{Nom} [A]	Part no.
40-1836	10	18	5.4	1.852	3011668
	12	18	8	1.5	3011669
	24	19	30	0.8	3008276
	28	19	41	0.683	3918750
	36	20	65	0.554	3011670
	48	20	116	0.414	3011672
50-1836	12	27	5.4	2.222	3002184
	24	27	21	1.143	3002104
50-2345	12	30	5.2	2.308	3274862
	12 -S	30	5.2	2.308	4250893
	24	30	19.2	1.25	3274863
	24 -S	30	19.2	1.25	4250892
	28 -S	30	26.1	1.073	4639060

DIMENSIONS

					
DIRECT CURRENT (DC)	**32-1329**	**40-1836**	**50-1836**	**50-2345**	**75-3164**
G 	A = 15 B = 23 C = 30 D = 23.9	A = 19.1 B = 30 C = 35.1 D = 23.8	A = 19.1 B = 30 C = 35.1 D = 23.8	A = 19.1 B = 30 C = 34.5 D = 28	A = 20 B = 32 C = 36 D = 37.5
	Form B	Form A			
K 	-	A = 18 B = 30 C = 34 D = 25.6	A = 18 B = 30 C = 34 D = 25.6	-	-
L 	A = 15.6 B = 23 C = 23 D = 26.5 E = 457	A = 12.6 B = 30 C = 31.7 D = 26.6 E = 457	A = 12.6 B = 30 C = 31.7 D = 26.6 E = 457	A = 11.6 B = 31 C = 30 D = 31 E = 420	-
	Lead length E for standard version. Further versions on request.				
N 	A = 31.5 B = 23 D = 32.8	A = 33.7 B = 27 D = 35.9	A = 33.7 B = 30 D = 33.7	A = 33.7 B = 27 D = 40.1	A = 52 B = 35 D = 50.1
O 	-	A = 28.1 B = 29 D = 51.8	A = 28.1 B = 29 D = 51.8	A = 27.1 B = 29 D = 56	-
T 	-	A = 11 B = 27 D = 26.8	A = 11 B = 27 D = 26.8	-	A = 19 B = 30.2 D = 40.3
U 	-	A = 26.4 B = 27 D = 35.7	A = 26.4 B = 27 D = 35.7	A = 26.4 B = 27 D = 40	-
ALTERNATING CURRENT (AC)		**40-1836**	**50-1836**	**50-2345**	**75-3164**
G 	-	A = 19.1 B = 30 C = 35 D = 26.5	A = 19.1 B = 30 C = 35 D = 26.5	A = 18.1 B = 30 C = 34 D = 30.7	A = 20 B = 32 C = 41.5 D = 40.3

All dimensions are given in millimetres and are subject to tolerance. The coils are not shown to scale.

COIL – VALVE COMBINATIONS

The following overview shows the available HYDAC directional valves to the sizes of the solenoid coils.
The detailed assignment of the standard coil designs is provided in the corresponding valve brochure.

Size 32-1329

Valve type	Symbol											
WK06	A	C	D	E	G	H	J	N	V	W	Y	Z
WS06											Y(R)	Z(R)

Size 40-1836

Valve type	Symbol												
DB08	PY												
DB10	PY												
DB12	PY												
DB16	PY												
DBM10120A	PY												
DBM12120A	PY												
DWM12121	ZMDY												
DR08	PY												
WK07	L												
WK08	A	C	D	J	K	L	P	R	V	W	X	Y	Z
WK081	A	C	D	J	K	L	P	R	V	W	X	Y	Z
WK10	E	G	H	J	T	Y-40							
WKM08130	C	D											
WKM08140	EB	X	Y										
WS08	D-51	V	W	Y(R)	Z(R)								
WS10	Y(R)	Z(R)											
WS12	Y(R)	Z(R)											
WS16	Y(R)	Z(R)											
WSM06020	V	W	Y(R)	Z(R)									
WSM10120	Y(R)	Z(R)											
WSM12120	BR	V	W	Y(R)	Z(R)								
WSM20121	V	W											

Size 50-1836

Valve type	Symbol													
WK10	A	C	D	JB	K	L	N	P	R	V	W	X	Y	Z
WS08	C	D	W-61											
WS10	V	W												
WSM03230	C	D												
WSM06020	W-61													
WSM08130	C	D												
WSM10120	V	W												

Size 50-2345

Valve type	Symbol										
4WE6 A01/A40	(A/B)E	C	D(T)	E(A/B)	F	G(A/B)	H(A/B)	J(A/B/R)	K(A)	L	M
	P	Q(A)	R	U	Y(T)						
4WE6 A08	C	D	E	G	H	J(A)	Q	Y			
WSE6	(B)E2	(B)E4	C	D	E	J+M(-2RV)	M+J-2RV	Z+X-2RV	E+H	H	U
	Y										
WSER6	(B)E2	(B)E4	D	Y							

Size 75-3164

Valve type	Symbol											
4WE10	AE	BE	BJ	C	D(-OF)	E(A/B)	F	G(A)	H(A/B)	J(A/B)	JR	K
	L	M	P	Q(A)	R	U(A)	Y					
4WE16	E	J										
4WER10	D	E(A/B)	G	L								
4WEW10 A01	D	E	H(A)	J(A)								

COILS WITH SUPPRESSOR DIODES

DIRECT CURRENT (DC)

Size	Diode	Blocking voltage U_Z [V]	Connection type + variant	Voltage U [V]	Part no.
32-1329	P4KE68CA	68	DG01	12 UL V0[1]	2610268
				24 UL V0[1]	2610269
			DL01	12 UL V0[1]	2610266
				24 UL V0[1]	2610267
			DN01	12 UL V0[1]	2610210
				24 UL V0[1]	2610265
40-1836			DK01	12	3050203
				24	3050204
			DN01	12	3036916
				12 UL V0[1]	3426665
				24	3036401
				24 UL V0[1]	3426666
				28	3269649
			DT01	12	3039432
				12 UL V0[1]	3426670
				24	3039430
				24 UL V0[1]	3426671
				28	3322583
			DU01	12	3317162
				24	3096576
50-1836			DN01	12	3091666
				12 UL V0[1]	3426784
				24	3091668
				24 UL V0[1]	3426785
			DT01	12	3031302
				12 UL V0[1]	3426788
				24	3091641
				24 UL V0[1]	3426789
				28	3468775
			DU01	12	3039437
				24	3039436
50-2345			DN01	12	3525251
				12 -S	4367306
				24	3525252
				24 -S	4367307
			DU01	12 -S	4437673

[1]UL certification of coils with flame rating V-0 in accordance with UL94.
For technical data, please refer to the corresponding coil under "Available coils“, page 3 onwards. Further versions on request.

NOTE

The information in this brochure relates to the operating conditions and fields of application described. For applications and operating conditions not described, please contact the relevant technical departments.
Subject to technical modifications.
Documents are only valid if they have been obtained via the website and are up-to-date.