COMBISTOP

Spring applied brakes

38

TÜV CERT
DIN ISO 9001

KEB

With manufacturing sites on three continents and a global sales network KEB ensures world-wide availability and support of the KEB COMBISTOP 38. This latest generation of spring applied brakes for dynamic and static applications stands out due to its enhanced design and high performance.

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General

KEB COMBISTOP is an electromagnetic-actuated dual-surface spring-applied brake for dry operation. The braking force is applied by the springs and neutralized through the electromagnetic force. For more than 30 years KEB spring applied brakes have a proven track record in a wide variety of applications e. g.

crane systems, driver-free transport and stacking systems, door and gate drives, vehicles for handicapped persons, brake motors/ geared motors or stage and warehouse technique

In a nutshell, KEB spring applied brakes can be found where shafts need to be held in position or rotating inertias need to be stopped.

Premium quality materials and the latest manufacturing techniques combined with the highest standards of precision engineering ensure safety and reliability.

KEB's international product specialist would be pleased to advise how KEB COMBISTOP 38 can be applied to satisfy your application requirements.

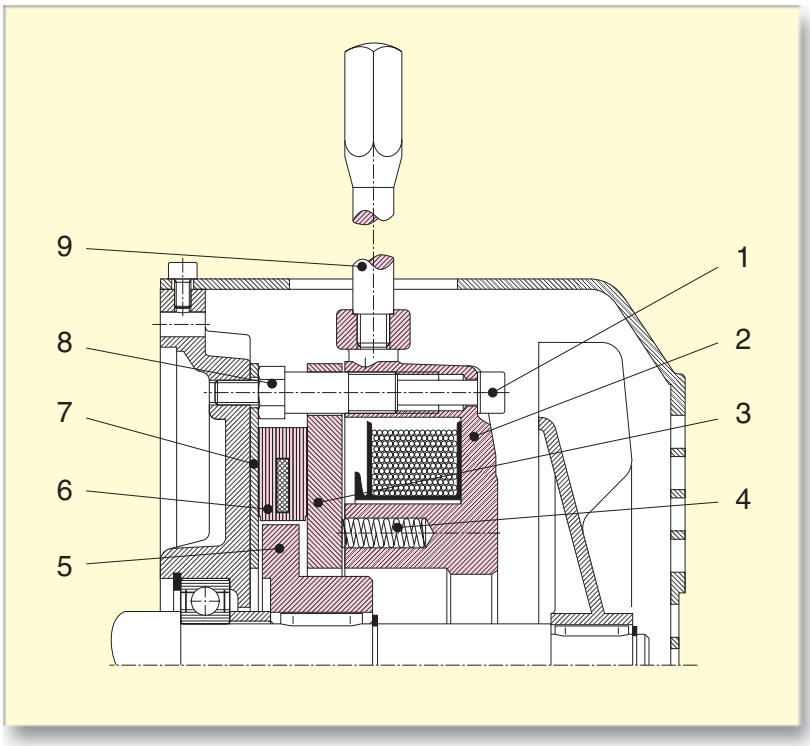
Design Features:

Outstanding design features are:

- Entire range uses asbestos free friction linings, which guarantee safe braking even under extreme conditions.
  Size 02…06: Steel driver disc with pressure bonded lining material
  Size 07…10: Splined metal lining carrier with chemical bonded lining material
  Size 11: Hub /lining system designed for backlash free operation.
- Braking torque adjustable between M_{2N} and 0.5 M_{2N}.(M_{2N} Nominal Torque)
- Patented clearance adjustment for easy mounting and adjustment without dismantling
- Hard wearing connection cable
- Housing material zinc plated
- Insulation class B as standard, insulation class F optional
- CSA, C/US and CE (low voltage) approved
- TÜV approved to DIN/VDE 0580
- Retrofit kit available for hand release
- Rated for 100% duty
- CE approval according to low voltage regulation
- Reduced wear due to hardened armature plates
- Standard protection IP40, up to IP66 optional (type 28)
- Hand release optional

Functional Description

In the power-off state the springs (4) press the armature plates (3) and the friction lining (6) against the friction surface. If a suitable friction surface is not available the optional friction disc (7) can be used. The friction lining is connected to the hub (5). The hub is mechanically linked to the shaft.
When applying the appropriate DC-voltage to the coil the magnet (2) generates an electromagnetic field, which attracts the armature plates therefore overcoming the spring force. Thus the lining is released allowing the shaft to rotate.



1 Machine screw
DIN EN ISO 4762 + DIN 6912 -8.8
(are not included)

2 Magnet

3 Armature plate

4 Pressure spring

5 Hub

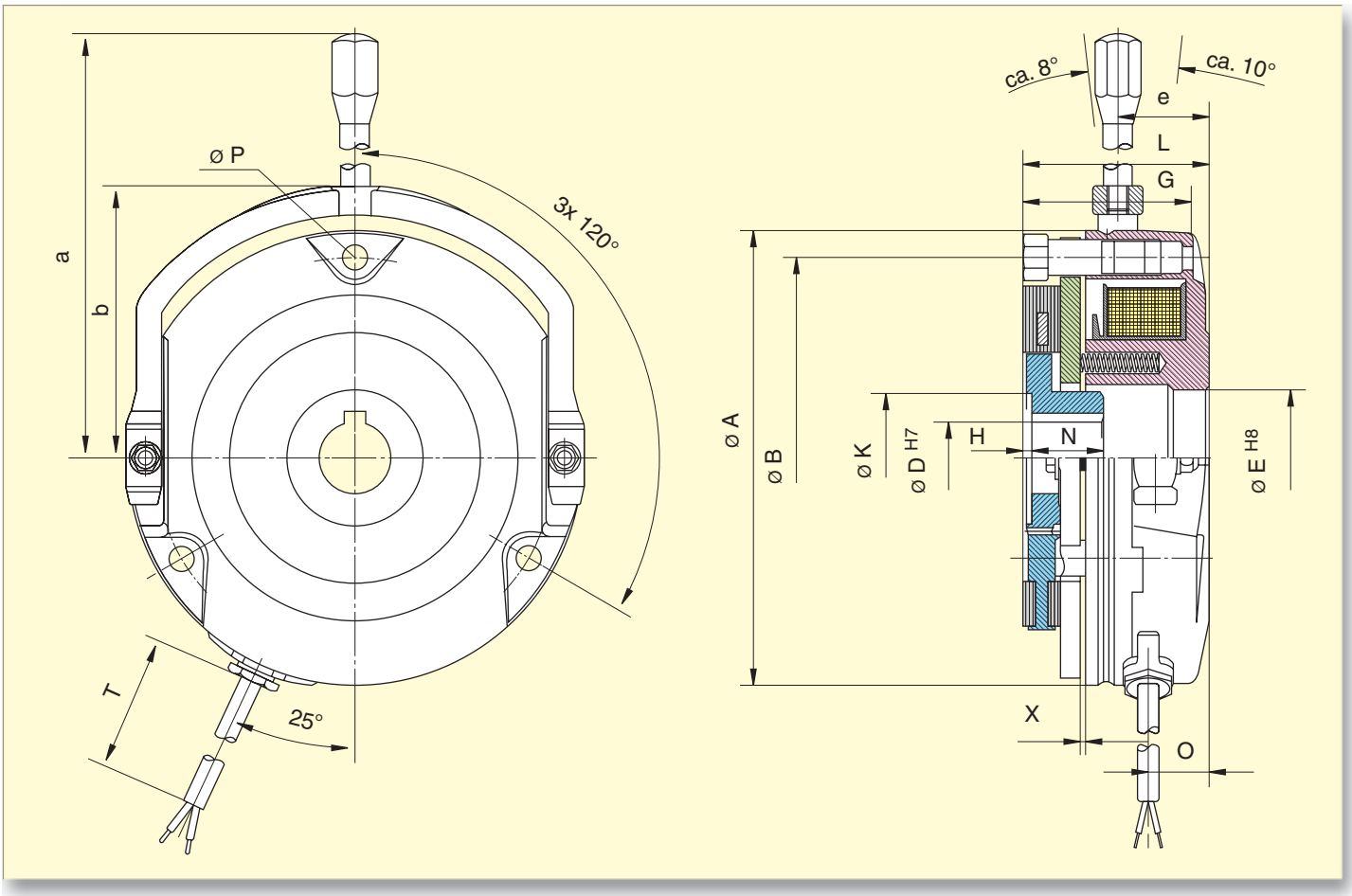
6 Lining

7 Friction disc (option)

8 Adjustable spacer

9 Hand release (option)

Technical Data



Version "N" - dynamic operation
...38.11N-0000 **without** hand release
...38.13N-0000 **with** hand release

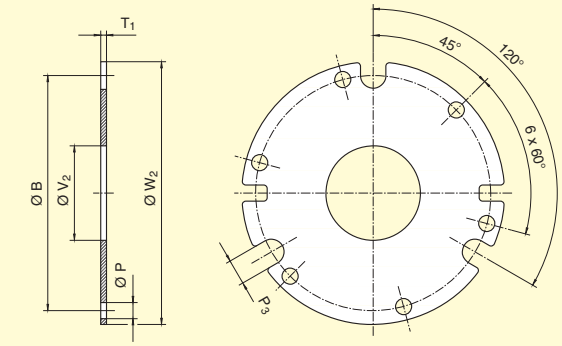
Version "H" - static operation
...38.11H-0000 **without** hand release
...38.13H-0000 **with** hand release

Size	Version "N"		Version "H"		A	B	H7 ØD max.	E	G	H	K	L	N	O	P	T	X	a	b	e
	M_{2N} Nm	P_{20} W	M_{2N} Nm	P_{20} W																
02	**5**	**25**	**7.5**	**25**	85	72	15**	22	34.2	1-1.5	22	37.7	18	11.5	3x4.5	500	0.2	105.5	53.5	23
03	**10**	**30**	**15**	**30**	102	90	20	32	37.2	2-2.5	31	41.7	20	13	3x5,5	500	0.2	113	62	25.5
04	**20**	**30**	**30**	**30**	127	112	25	38	47.2	2-2.5	37	51.7	20	16,5	3x6,5	500	0.2	128	76	26.2
05	**36**	**48**	**50**	**48**	147	132	30	42	52.7	2.5-3	42	57.7	25	18,5	3x6,5	500	0.2	168	86	30.5
06	**70**	**62**	**90**	**75**	164	145	35**	47	59.8	2.5-3	42	68.8	30	20	3x9	500	0.3	176	96	39.5
07	**100**	**65**	**150**	**90**	190	170	45	62	68	3	57	75.5	30	21.5	3x9	750	0.3	225	115	41
08	**150**	**75**	**225**	**90**	218	196	60	78	80	4.5	57/76*	87.4	35	27	3x9	750	0.4	235	125	46.5
09	**250**	**80**	**375**	**115**	253	230	60	97	88.2	5	76	101.7	40	28	3x11	750	0.4	256	146	56
10	**500**	**130**	**750**	**180**	307	278	75	120	98.8	9.5	92	111.3	50	25	6x11	750	0.5	335	175	59
11	**1000**	**180**	**1500**	**280**	363	325	90	140	122.1	-	-	134.5	100	30.5	6x11	1000	0.6	***	***	***

All dimensions in mm Keyway acc. to DIN 6885/1, VDE 0580, ISO-class "B" * Hub-Bore > Ø 45 ** keyway acc. to DIN 6885/3 *** mech. release with hexagon screw

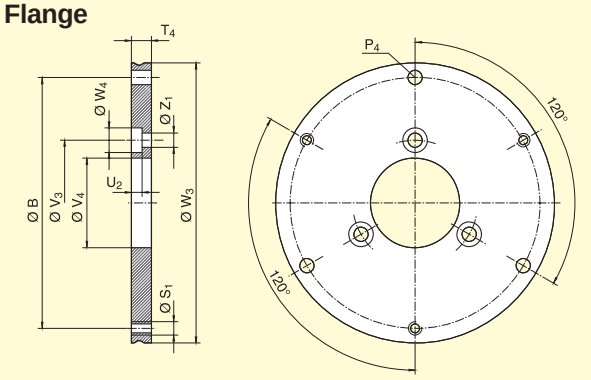
Accessories, Technical Data

Friction disc



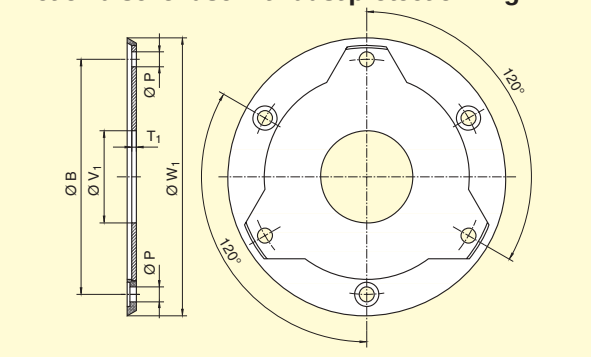
Art.-No. xx.08.451-xxxx										
Size	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**
B	72	90	112	132	145	170	196	230	278	
P	4.5	5.5	6.5	6.5	9	9	9	11	11	
T_1	1.5	2.0	2.0	2.0	2.5	2.5	2.5	3	4	
P_3	7.5	8.5	10.5	18	18	18	14.5	17	17	
V_2	27	35.5	42.5	47	51	85	100	105	198	
W_2	82	98	123	146	157	188	214	250	302	
Weight [kg]	0.05	0.10	0.15	0.22	0.30	0.40	0.64	0.93	1.50	

Flange



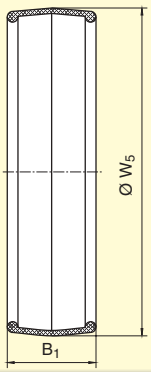
Art.-No. xx.38.510-0009 (nickel plated)										
Size	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**
B	72	90	112	132	145	170	196	230	278	325
P_4	3x4.3	3x5.3	3x6.4	3x6.4	3x9	3x9	3x9	3x11	6x11	8x11
S_1	3xM4	3xM5	3xM6	3xM6	3xM8	3xM8	3xM8	3xM10	6xM10	8xM10
T_4	6	7	9	9	11	11	11	11	12.5	20
U_2	3.2	4.1	4.8	4.8	6	6	6	7.5	7.5	
V_3	30	45	56	62	74	84	100	120	150	
V_4	20	30	40	45	55	65	75	90	120	160
W_3	83	100	125	145	163	190	217	254	306	363
W_4	3x8	3x10	3x11	3x11	3x15	6x15	6x15	6x18	6x18	
Z_1	3x4.3	3x5.3	3x6.4	3x6.4	3x9	6x9	6x9	6x11	6x11	
Weight [kg]	0.20	0.35	0.75	1	1.50	2.10	2.70	3.70	5.90	12.7

Friction disc for use with dust protection ring



Art.-No. xx.08.515-xxxx										
Size	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**
B	72	90	112	132	145					
P	4.5	5.5	6.5	6.5	9					
T_1	1.5	2	2	2	2.5					
V_1	27	35.5	42.5	47	51					
W_1	88.5	106	132	153	171					
Weight [kg]	0.05	0.10	0.15	0.25	0.35					

Dust protection ring



Art.-No. xx.08.550-xxxx										
Size	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**
B_1	22.5	25	33	33.5	38.5	45.5	49	54.5	63	*upon request!*
W_5	86	103	129	149	167	195	222	259	310	

Accessories, Description

Friction Disc
Friction disks offer a suitable friction surface for spring applied brakes and are available in hardened and rust-free versions. If required KEB COMBISTOP can be used with a rust-free friction disc on the motor B-side. With rust-free versions the friction lining shows a reduction in service life and in the permissible friction work.

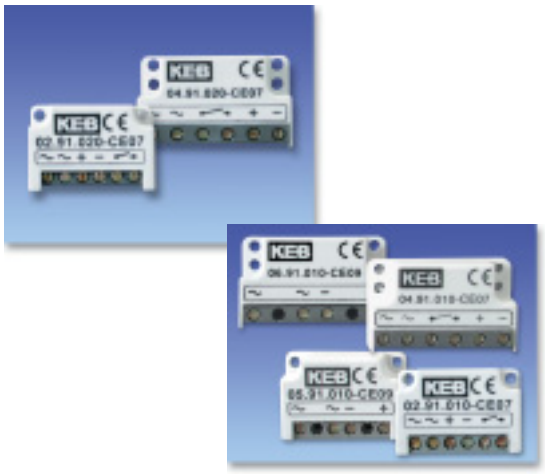
Dust Protection Ring
Dust protection rings are used to protect KEB COMBISTOP friction surfaces from dust and dripping water. When using dust protection rings a special friction disc or a flange is required for locating the dust protection ring.

Flange
The mounting flange can be used as a hard wearing friction surface.

Micro Switch
KEB COMBISTOP can be fitted with a micro switch to monitor the operation and wear of the brake. This safety feature is commonly used on frequency inverter driven braked motors in hoist and elevator applications.

Rectifiers
KEB COMBISTOP 38 requires DC-voltage for operation. KEB offer a comprehensive range of full and half wave rectifiers for AC- and DC-switching.The KEB Powerbox combines the operation of full and half wave rectifiers. This improves the overall performance of the brake with respect to switching time , wear and operational air gap, relative to the supply and the coil voltage.

Switching Cycles and Switching Times Type 38



Size	Switching Cycles					AC-switching		DC-switching	
	M_{2N}	P_{20}	SC_1	SC_2	t_2	t_{11}~	t_1~	t_{11}=	t_1=
	[Nm]	[W]	[1/min]	[1/min]	[ms]	[ms]	[ms]	[ms]	[ms]
02	5	20	60	120	40	70	100	10	20
03	10	25	40	75	55	100	150	15	30
04	20	30	40	75	90	180	200	25	50
05	36	40	25	50	110	220	240	25	55
06	60	52	5	10	240	260	330	25	90
07	100	65	5	10	220	400	650	40	120
08	150	75	5	10	320	700	900	50	180
09	250	75	2	5	350	900	1200	60	220
10	500	130	1	3	400	1400	2000	100	300
11	1000	180	1	2	750	3100	3500	450	1000

The indicated times are average values !

SC_1 applicable for rectifiers:
02.91.010-CE07
02.91.020-CE07
02.91.010-CEMV

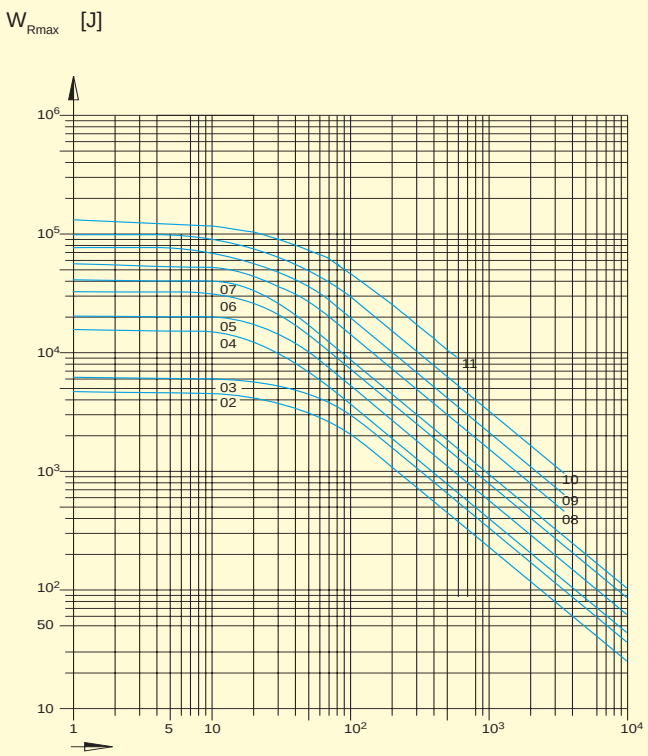
SC_2 applicable for rectifiers:
04.91.010-CE07
04.91.020-CE07
05.91.010-CE09
06.91.010-CE09

SC **[min^{-1}]** Maximal permissible switching cycle per minute at DC-side switching and max. operating temperature of 80 °C.
t_1 **[ms]** Engaging time (Time from disconnecting the current to attaining the rated torque).
t_{11} **[ms]** Engagement delay time (Time from disconnecting the current to the rise of the torque).
t_2 **[ms]** Release time (Time from connecting the current to the beginning of torque decrease).

The designation of the switching times corresponds to DIN VDE 580 (10.94).

The KEB Powerbox combines the operation of full and half wave rectifiers. This improves the overall performance of the brake with respect to switching time, wear and operational air gap, relative to the supply and the coil voltage.

Permissible friction / Switching frequency



Permissible friction W_{Rmax} [J] depending on the switching frequency

Valid only for the stated revolutions per minute

02.38. up to 07.38. - 3000 rpm
08.38. up to 11.38. - 1500 rpm

The values for W_{Rmax} are valid for standard brakes and a second friction surface of casting. Depending on application these values may be exceeded or remained under.

Rustfree friction discs, or speeds higher than specified in the diagram, reduce the permissible friction work considerably.
If the rated torque of the brake is reduced by turning the adjustment ring the permissible friction work increases.

W_{Rmax} *= permissible friction depending on the switching frequency*

Operation data

Size	max. speed Operation Stop [min^{-1}]	max. speed Emergency Stop [min^{-1}]	*J* [10^{-3} kgm^2]	W_{zul} [J]	g_{min} [mm]	X_n [mm]
02	3000	6000	0.025	1700	5.5	0.4
03		6000	0.072	2000	6.5	0.5
04		6000	0.136	5000	8	0.6
05		5000	0.35	7000	10	0.6
06		5000	0.56	10000	10	1
07		4500	1.57	13000	10	1
08	3000	3500	5.92	17000	11	1.2
09	1500	3000	7.38	20000	12	1.2
10	1500	3000	20.54	25000	14	1.5
11	1500	2000	180.7	30000	28	1.5

J *moment of inertia*

W_{zul} *friction at emergency stop*

g_{min} *min. permissible lining thickness*

X_n *clearance at which an adjust ment is recommended*

This catalogue contains general information regarding the KEB COMBISTOP 38. For further technical information please contact our product specialists and refer to the KEB COMBISTOP 08 catalogue.

people in motion

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