

COMBISTOP are electromagnetically actuated dual surface spring-applied DC brakes for dry application. The braking force is applied by the springs and released through the electromagnetic force. These brakes are successfully working in the most demanding applications and are used wherever rotating masses must be stopped or shafts need to be held in a precise position.

High quality materials together with high precision manufacturing, process inspections and functional testing guarantee reliable, safe operation.

On request we can design the **COMBISTOP** brake to your requirements, for example the brake can be supplied with pre-mounted armature and increased torque.

Program Schedule

COMBISTOP Electromagnetically actuated dual-surface spring applied DC brakes

Mini brakes 0,3 ... 2 Nm	page 5	COMBISTOP M
Holding brake for dynamic demands 2 ... 1.000 Nm	page 6	COMBISTOP N
Holding brake for static application 5 ... 1.500 Nm	page 6	COMBISTOP H
Holding brake for protection class IP 66 4 ... 400 Nm	page 8	COMBISTOP P
Holding brake for tacho mounting 4 ... 250 Nm	page 8	COMBISTOP T
Double-brake for theatre, lift and elevators 2 x 5 ... 2 x 1000 Nm	page 10	COMBISTOP D
Hoisting brakes, elevator brakes D8 2 x 25 ... 2 x 125 Nm	page 10	COMBISTOP L
Accessories	page 12	

Technical data

switching times	page 15
dimensioning / calculation	page 50
Legend	page 51

Accessories

COMBISTOP	M	N	H	P	T	D	L
friction disc		X	X			X	X
flange	X	X	X	X	X	X	X
friction disc with collar				X			
dust protection ring		X				X	
micro switch		X	X			X	X
hand release	X	X	X	X	X		X
terminal box		X	X	X	X	X	X

COMBISTOP M

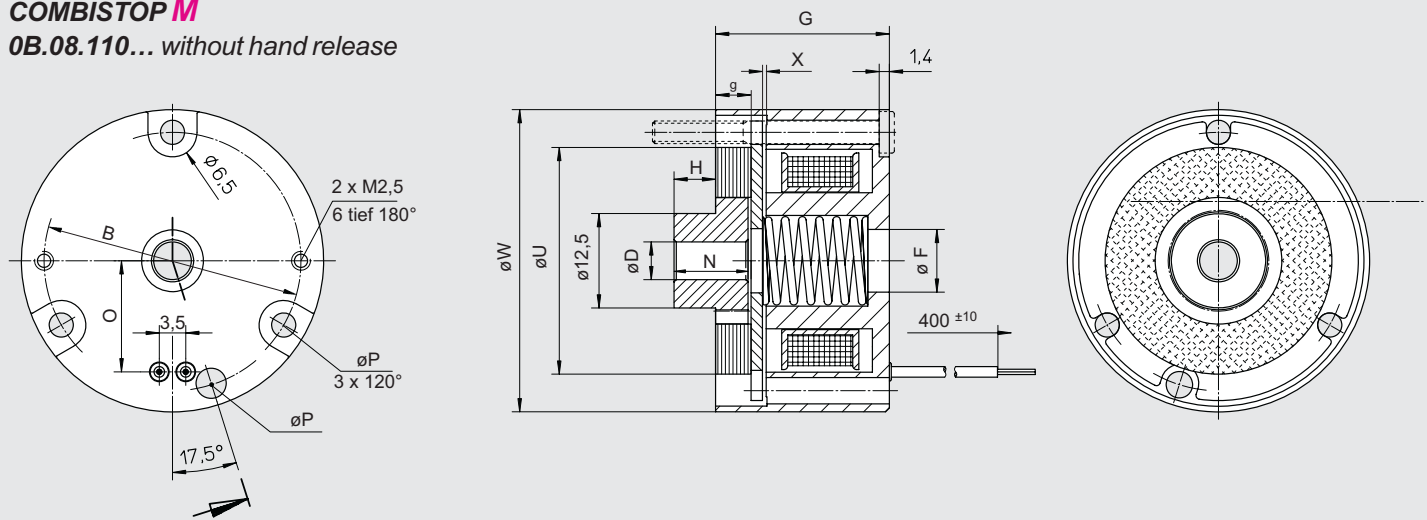
stands for MINI Brake, the small compact solution with torques up to 2 Nm. The brake is characterized by a particular compact construction, it is designed for small loads and holding functions without torque adjustment and adjustability and available with or without hand release.



Range of application: e.g. general machine building, small-power motors, automation technique, apparatus engineering.

COMBISTOP M

0B.08.110... without hand release



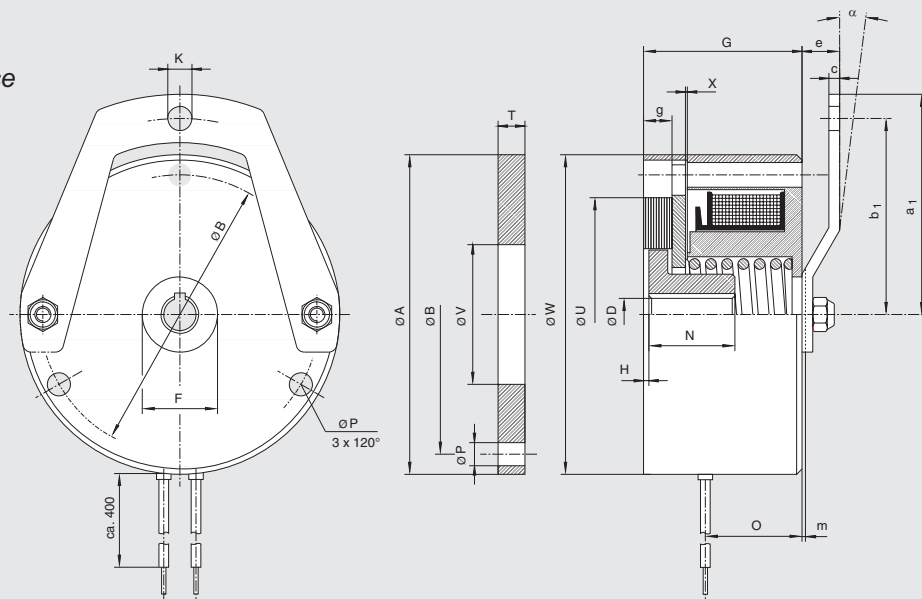
size	M _{2N} ¹⁾ [Nm]	P ₂₀ [W]	A	B	D	F	G	H	K	N	O	P	T	U	V	W	X	a ₁	b ₁	c	e	g	m ³⁾	a°	weights [kg]
0B.08	0.3	6		34	5	8,3	23	5,5		9.8	14.7	3.5		30	40	0.1						4.7			0.15
00.08	0.5-2	11-15	59.5	52	10 ²⁾	14	29.5	0.5-1	4.5	16	18	4.3	5	43.5	26	59,5	0.15	41	36.5	2	7	5.5	0.8	7	0.4

All dimensions in mm keyway according to DIN 6885/1 according to VDE 0580, isolation class „B“ ¹⁾ static braking torque after completed run-in-phase ²⁾ bore tolerance Ø 10 mm H7, otherwise H8 ³⁾ Mounting dimension „m“ with attracted armature

COMBISTOP M

00.08.110... without hand release

00.08.130... with hand release



Accessories **COMBISTOP M:**

- flange

COMBISTOP

COMBISTOP **N** and **H**

are the standard series of dual-surface spring-applied brakes in two designs:

- dynamic applications with continuous stress
- static applications with short-term stress

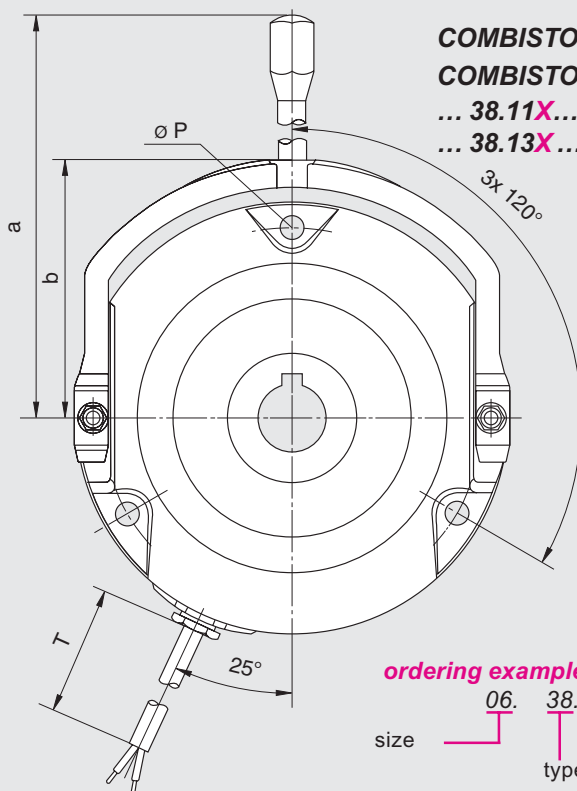
COMBISTOP N
COMBISTOP H

COMBISTOP N: Rated torque in the range 5 ... 1000 Nm - designed for dynamic applications with regular brake applications at high speed!

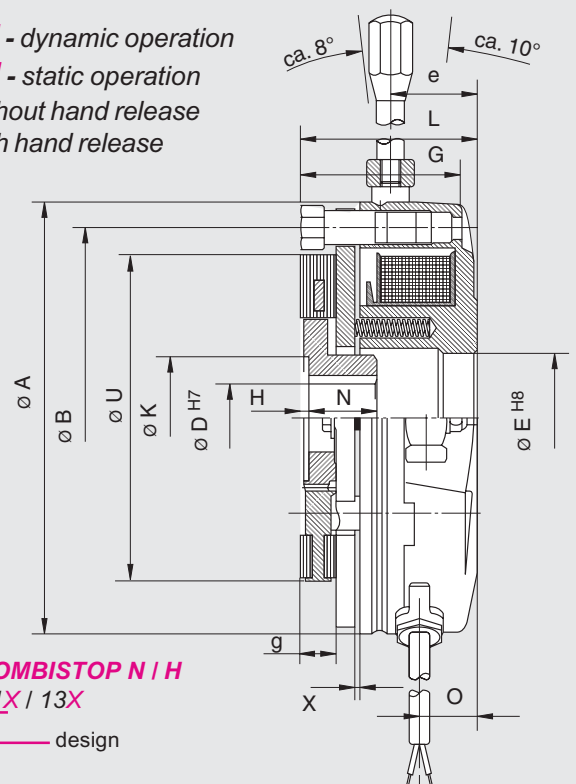
Range of application: e.g. brake motors, geared brake motors

Accessories **COMBISTOP N:**

- friction disc
- flange
- friction disc with collar (up to size 06)
- dust protection ring
- micro switch
- terminal box



COMBISTOP N - dynamic operation
COMBISTOP H - static operation
... **38.11X**... without hand release
... **38.13X**... with hand release



ordering example: **COMBISTOP N / H**

size 06 38 11X / 13X
type design
V DC, Ø D ?

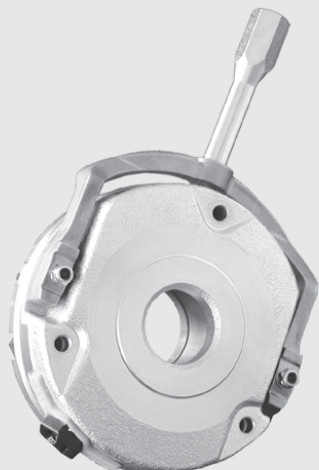
size	version "N"		version "H"		A	B	H7 Ø D max.	E	G	H	K	L	N	O	P	T	U	X	a	b	e	g
	M _{2N} Nm	P ₂₀ W	M _{2N} Nm	P ₂₀ W																		
02	5	25	7,5	25	85	72	15**	22	34.2	1-1.5	22	37.7	18	11.5	3x4.5	500	60	0.2	105.5	53.5	23	7.5
03	10	30	15	30	102	90	20	32	37.2	2-2.5	31	41.7	20	13	3x5.5	500	77	0.2	113	62	25.5	8
04	20	30	30	30	127	112	25	38	47.2	2-2.5	37	51.7	20	16.5	3x6.5	500	96	0.2	128	76	26.2	10.5
05	36	48	50	48	147	132	30	42	52.7	2.5-3	42	57.7	25	18.5	3x6.5	500	115	0.2	168	86	30.5	12
06	70	62	90	75	164	145	35**	47	59.8	2.5-3	42	68.8	30	20	3x9	500	115	0.3	176	96	39.5	12
07	100	65	150	90	190	170	45	62	68	3	57	75.5	30	21.5	3x9	750	149	0.3	225	115	41	14
08	150	75	225	90	218	196	60	78	80	4.5	57/76*	87.4	35	27	3x9	750	175	0.4	235	125	46.5	16
09	250	80	375	115	253	230	60	97	88.2	5	76	101.7	40	28	3x11	750	206	0.4	256	146	56	18
10	500	130	750	180	307	278	75	120	98.8	9.5	92	111.3	50	25	6x11	750	252	0.5	335	175	59	22
11	1000	180	1500	280	363	325	90	140	122.1	-	-	134.5	100	30.5	6x11	1000	300	0.6	***	***	***	30

All dimensions in mm keyway according to DIN 6885/1 Standard voltage 24 / 105 / 180 / 205 V DC according to VDE 0580, isolation class „B“
 * hub bore > ø 45 ** keyway according to DIN 6885/3 *** mech. release with hexagon screw

COMBISTOP *N* and *H*

COMBISTOP *H*: Rated torque in the range 7.5 ... 1500 Nm - designed for static applications, i.e. braking from low speeds and secure holding of loads!

Range of application: e.g. electronically controlled or regulated drives



Accessories COMBISTOP *H*:

- friction disc
- flange
- friction disc with collar (up to size 06)
- dust protection ring
- micro switch
- terminal box



COMBISTOP T

Two brakes designs which are always used whenever the application puts higher demands on the protection

COMBISTOP T: the IP 65-brake with identical hole circle such as **COMBISTOP N** and **H**, optionally complete prepared for the attachment of tacho-generators (xx.28.GxT) or shaft sealing ring.

Range of application: e.g. general machine building, crane construction, ship gear, wind energy plants

size	M _{2N} [Nm]	P ₂₀ [W]	øA ₁	øA _{h8} H8	øB	C	øD max.	øE	øE ₁	øF	øG	H	øK	L	M	M ₁	N	O	øP	øP ₁	øP ₂	R	T	øV
02	4	20	102	98	72	34	15**	50	85	94.5	88	1-1.5	22	37.5	2.4	88x3	18	11	4.5	8	M4	0.5	6	37
03	8	25	123	118	90	37	20	64	102	116	109.5	2-2.5	31	41.1	2.4	110x3	20	12.5	5.6	10	M5	1.5	7	48
04	16	30	148	143	112	47	25	80	127	138.5	132	2-2.5	37	51.1	2.4	132x3	20	16	6.5	11	M6	1.5	9	60
05	32	40	170	165	132	51.5	30	102	147	158.5	152	2.5-3	42	56.1	2.4	152x3	25	17	6.5	11	M6	2	9	70
06	60	52	186	180	145	60	35**	115	164	176.5	170	2.5-3	42	66.5	2.4	170x3	30	20	9	15	M8	2	11	70
07	100	65	216	210	170	68	45	144	193	200.5	196	2.0	57	74	3.5	196x4	30	20	9	15	M8	3.0	12	75
08	150	75	246	240	196	77	60	160	217	235.5	225	4.5	57 76*	86.5	3.2	225x4	35	25	9	15	M8	3.5	14	95
09	250	75	280	240	230	86	60	180	254	272	260	5.0	76	102	3.5	260x5	40	33	11	18	M10	4.0	15	95

all dimensions in mm keyway according to DIN 6885/1 standard voltage 24 / 105 / 180 / 205 V DC according to VDE 0580, ISO-class „B“ * hub bore > ø 45
** keyway according to DIN 6885/3

Accessories **COMBISTOP T**:

- flange
- terminal box
- hand release
- shaft sealing ring



COMBISTOP P: completely closed version in protection class IP 66 with sealing of the mounting side and electrical connection, optionally with internally running connecting cable or attached terminal box.

Range of application: e.g. general machine building, crane construction, ship gear, wind energy plants

size	M _{2N} [Nm]	P ₂₀ [W]	øA	øB	H7 øD max.	øE	øF	øG	H	øK	L	M	M ₁	N	O	R	S	S ₁	sw	T	T ₁	øV	øV ₁	W
02	4	20	108	100	15**	50	94	88	1-1.5	22	38	2.4	88x3	18	13.5	2	4.5	8	11	6	6	20	37	43
03	8	25	138	125	20	64	116.5	110	2-2.5	31	42.2	2.4	110x3	20	14	2	6.5	8	11	7	7	40	48	57.5
04	16	30	160	148	25	80	139	132	2-2.5	37	51.2	2.4	132x3	20	16	2	6.5	8	11	8.5	9	40	61	68
05	32	40	190	175	30	102	163	154	2.5-3	42	56.2	3.5	155x4	25	17	2	8.5	10	14	9	10	47	71	82
06	60	52	200	185	30	115	173	164	2.5-3	42	66.5	3.5	164x4	30	20	2	8.5	10	14	10	11	55	71	87
07	100	65	238	220	45	144	206	196	3	57	74	3.2	196x4	30	20	-	11	14	17	12	12	75	-	100
08	150	75	268	250	60	160	235	225	4.5	57 76*	86.5	3.2	225x4	35	27	-	11	14	17	14	14	95	-	114
09	250	75	312	290	60	180	272	260	5	76	102	4	260x5	40	33	-	14	14	17	15	15	95	-	131.5
10	400	130	362	340	75	230	322	310	9.5	92	110	4	310x5	50	35	-	14	16	19	15	15	120	-	158

all dimensions in mm keyway according to DIN 6885/1 standard voltage 24 / 105 / 180 / 205 V DC according to VDE 0580, ISO-class „B“ * hub bore > ø 45
** keyway according to DIN 6885/3

COMBISTOP D



stands for **double safety** and covers a series of double brakes, which is prepared for tasks with redundant brake circuits.

The mechanical construction with two completely independent fail-safe spring-applied brakes meets the requirements according to DIN 56921 and DIN 56925 (BGV C1).

The brakes are supplied ex factory, ready for attachment with preadjusted air gaps.

Extensive constructional measures reduce the switching and running noises to a minimum.

size	M _{2N} (Nm stat.)	P ₂₀ (W)	A	B	C	1 & 2 D (max)	E	F	H	L ₁	L ₂	M	N1	N ₂	R ₁	T	X	a	b	e ₁	e ₂
02	2x5	2x25	85	72	22	15**	22	36	91.2	9.5	1.5	18	27.5	13	8	500	0.2	105.5	53.5	45.5	22.5
03	2x10	2x30	102	90	32	20	31	48	106	12.5	2.5	20	34	17	10	500	0.2	114	62	54	27
04	2x20	2x30	127	112	38	25	37	60	121	12.5	2.5	20	39	23	10	500	0.2	128	76	65	31
05	2x36	2x48	147	132	42	30	42	70	135	14	3	25	41	21	11	500	0.2	168	86	72	33
06	2x70	2x62	164	145	47	35**	42	70	157	16	3	30	45	20	13	500	0.3	176	96	81	36
07	2x100	2x65	190	170	62	45	57	75	180	18.5	3	30	59	37	15	750	0.3	225	115	94	45
08	2x150	2x75	218	196	78	60	57/76*	100	193	19.5	5	35	55	33	14.5	750	0.3	235	125	97	50
09	2x250	2x80	254	230	97	60	76	100	224	22	5.5	40	65	45	16.5	750	0.3	256	146	107	56
10	2x500	2x130	306	278	120	75	92	120	241	27	10	50	63	36	17	750	0.4	335	175	121	61
11	2x1000	2x180	upon request																		

all dimensions in mm keyway according to DIN 6885/1 standard voltage 24 / 105 / 180 / 205 V DC according to VDE 0580, ISO-class „B“ * hub bore > ø 45
** keyway according to DIN 6885/3

As special development for the elevator industry the dual-circuit spring-applied fail-safe brake fulfills the valid requirements of EN 81 respectively TRA 227.

The brake series, tested by the technical inspection authority, contains two mechanical braking circuits and offers compact dimensions and easy mounting.

Range of application: e.g. passenger and freight elevators, theatre equipment

Accessory **COMBISTOP L** :

- friction disc
- flange
- micro switch
- terminal box

size	2 x M _{2N} (Nm stat.)	P ₂₀ (W)	A	B	C	D ^{H7}	E	F	G	H		L		N	O	X _n
										D8.230	D8.630	D8.230	D8.630			
05	25	60	154	146	132	30	42	65	147	3	3	53.8	54.3	25	19.5	0.3
07	50	65	203	188	170	40	57	65	190	3	3	74.3	74.3	30	20	0.4
09	125	75	268	230	230	60	76	101	254	5	5	98.7	98.7	40	20	0.5

size	a	b	d	e		l	m	P1*	P2*	P3*	2 x X _v D8.630	SW	a°	d°
				D8.230	D8.630			ISO 4762	ISO 4762	ISO 4762				
05	169	89	10	34.8	35.3	2.5	1.2	M6x65	M6x10	M5x40	0.15	14	10	28
07	225	115	14	33.5	33.5	2.5	1.3	M8x80	M8x12	M6x50	0.20	17	10	25
09	255	145	14	65.7	65.7	3.0	1.4	M10x100	M10x16	M8x75	0.25	17	10	25

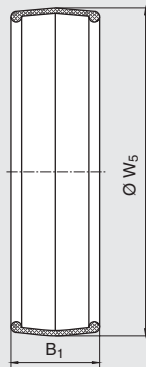
all dimensions in mm keyway according to DIN 6885/1 standard voltage 24 / 105 / 180 / 205 V DC according to VDE 0580, ISO-class „B“
* hub bore > ø 45 ** keyway according to DIN 6885/3 see dimension diagram D8.M01-4-0707

COMBISTOP Accessories

To adapt the spring-applied brakes to the various requirements of different applications an extensive program with a wide range of accessories is available.

Please contact us to discuss your requirements. To ensure correct selection we have on hand an experienced team of application engineers to assist you in all aspects of selection, enabling you to get the optimum solution.

Accessory - dust protection ring (IP44) ...08.550-0009

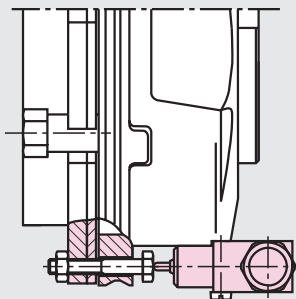


To protect the friction surfaces against dust or dripping water different sizes of dust protection rings are available. When fitting the **COMBISTOP** with a dust protection ring the friction disc must be used on the motor side. This friction disc will be supplied nitrated and is especially designed to hold the dust protection ring.

article number xx.08.550-0009										
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	
W_5	86	103	129	149	167	195	222	259	310	upon request

all dimensions in mm

Accessory - micro switch

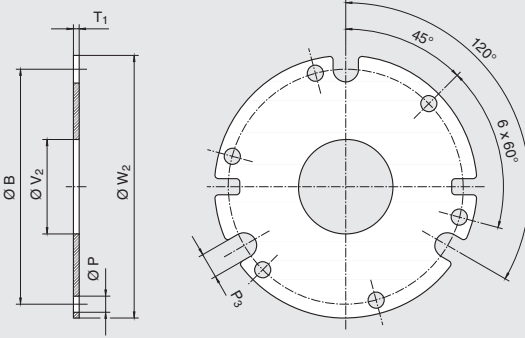


The use of **COMBISTOP** can be fitted with a micro switch for monitoring the functions and the wear. The use of **COMBISTOP** with micro switch is particularly sensible for braking motors on hoisting gears that are operated with frequency inverters.

Detailed mounting dimensions and technical data are provided in the dimension sheet 08.M01-3-0604.

Friction discs and **flanges** provide suitable counter-rotation surfaces for the spring applied brakes and are available in hardened and rustproof design.

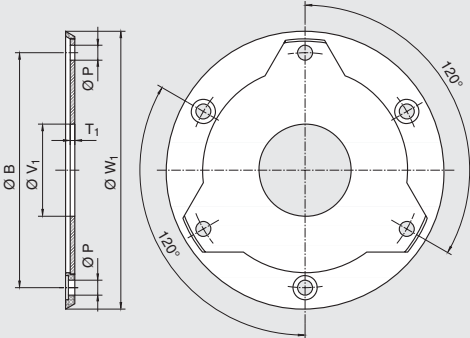
Accessory - friction discs ...08.451...



article number 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	
T₁	1.5	2	2	2	2.5	2.5	2.5	3	4	
P₃	7.5	8.5	10.5	18	18	18	14.5	17	17	
V₂	27	35.5	42.5	47	51	85	100	105	198	
W₂	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	

all dimensions in mm

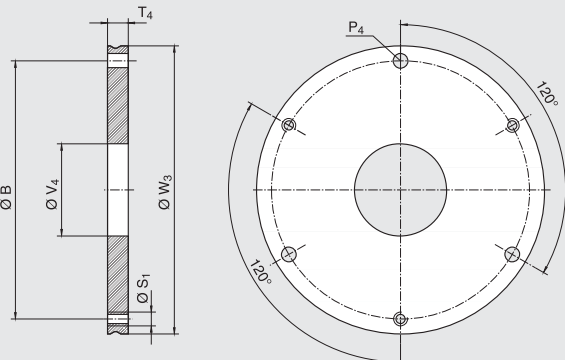
Accessory - friction discs with collar ...08.515...



article number 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					
T₁	1.5	2	2	2	2.5					
V₁	27	35.5	42.5	47	51					
W₁	88.5	106	132	153	171					
weight[kg]	0.05	0.10	0.15	0.25	0.35					

all dimensions in mm

Accessory - flange with collar for dust protection ring ...08.510...



article number xx.38.510-0009											
size	00	02	03	04	05	06	07	08	09	10	11
B	52	72	90	112	132	145	170	196	230	278	325
P₄		3x4,3	3x5,3	3x6,4	3x6,4	3x9	3x9	3x9	3x11	6x11	8x11
S₁		3xM4	3xM5	3xM6	3xM6	3xM8	3xM8	3xM8	3xM10	6xM10	8xM10
T₄	5	6	7	9	9	11	11	11	11	12.5	20
V₄	26	20	30	40	45	55	65	75	90	120	160
W₃	60	83	100	125	145	163	190	217	254	306	363
weight [kg]	0.08	0.20	0.35	0.75	1	1.50	2.10	2.70	3.70	5.90	12.7

all dimensions in mm

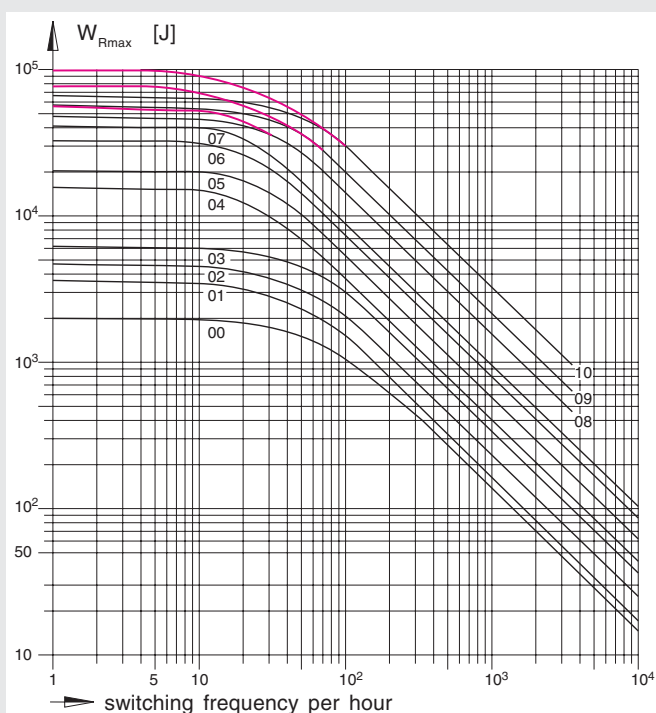
Technical data

max. speed

size	operating stop [rpm]	max. speed		J		g _{min} [mm]	X _n [mm]
		type M, P, T emergency stop [rpm]	type N, H, D emergency stop [rpm]	type M, P, T [10 ⁻³ kgm ²]	type N, H, D [10 ⁻³ kgm ²]		
0B	3000	6000	-	0.001	-	-	-
02	3000	6000	6000	0.025	0.025	5.5	0.4
03	3000	6000	6000	0.072	0.072	6.5	0.5
04	3000	6000	6000	0.136	0.136	8	0.6
05	3000	5000	5000	0.35	0.35	10	0.6
06	3000	5000	5000	0.56	0.56	10	1
07	3000	4500	4500	1.57	1.57	10	1
08	3000	3500	3500	5.92	5.92	11	1.2
09	1500	3000	3000	7.38	7.38	12	1.2
10	1500	3000	3000	20.54	20.54	14	1.5
11	1500		2000		180.7	28	1.5

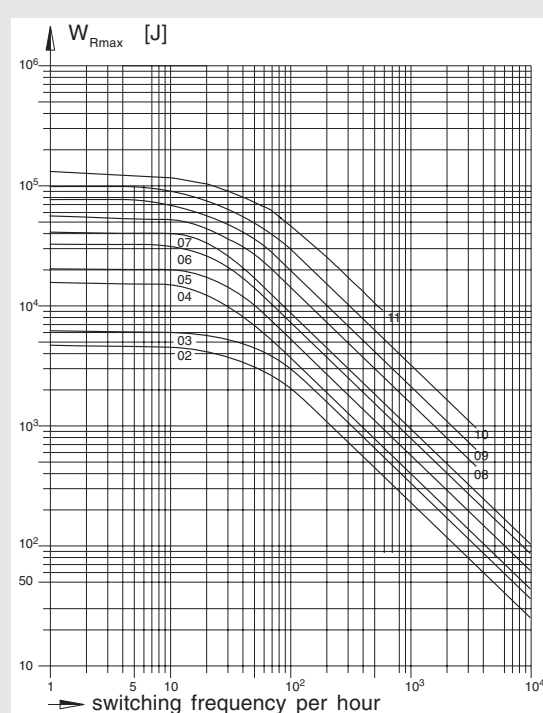
g_{min} min. permissible lining thickness [mm]

Friction switching frequency Type M, P, T



Red line for brake without friction disc

Friction switching frequency Type N, H, D



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

Valid only for the stated revolutions per minute

type **M, P, T, N, H, D** size 0B. ... 07. - 3000 rpm

type **P, T, N, H, D** size 08. ... 11. - 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 (optional) the permissible friction work increases.

COMBISTOP

Switching cycles and switching times

size	M _{2N} [Nm]	P ₂₀ [W]	switching cycles		t ₂ [ms]	AC-switching		DC-switching	
			SC ₁ [1/min]	SC ₂ [1/min]		t _{1~} [ms]	t _{1~} [ms]	t ₁₌ [ms]	t ₁₌ [ms]
00	1	11	70	140	35	60	100	12	25
02	4/5	20	60	120	40	40/70	90/100	10	20
03	8/10	25	40 / 60	75	60/55	80/100	140/150	15	30
04	16/20	30	40 / 60	75	100/90	140/180	200	20/25	50
05	32/36	40	25	50	120/110	180/220	240	25	55
06	60	52	5	10	240	200/260	330	25	90
07	100	65	5	10	240/220	400	650	50/40	150/120
08	150	75	5	10	300/320	700	900	60/50	180
09	250	75	2	5	350	900	1200	60	220
10	400/500	130	1	3	350/400	1400	1800/2000	60/100	250/300
11	1000	180	1	2	750	3100	3500	450	1000

variations COMBISTOP type **N, H, D**

SC₁ applicable for rectifiers:

02.91.010-CE07
02.91.020-CE07
02.91.010-CEMV

SC₂ applicable for rectifiers:

04.91.010-CE07
04.91.020-CE07
05.91.010-CE09
06.91.010-CE09

SC maximal permissible switching cycle

at DC-side switching and max. operating temperature of 80 °C.

[min⁻¹]

t₁ engaging time

time from disconnecting the current to attaining the rated torque.

[ms]

t₁₁ engagement delay time

time from disconnecting the current to the rise of the torque.

[ms]

t₂ release time

time from connecting the current to the beginning of torque decrease.

[ms]

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

Switching cycles COMBISTOP with POWERBOX

size	t ₂ [ms]	max. air gap [mm]	switching cycles [1/min]
02	20	1.0	55
03	35	1.8	40
04	50	2.1	40
05	60	3.0	25
06	120	3.0	5
07	120	3.5	5
08	150	3.0	5
09	170	3.5	2
10*	180	4.5	1

* Continuous operation only permissible at 45°C !

230 V AC input voltage and 105 V DC coil

Switching times apply to rated air gap X

Switching cycles apply to DC-side switching

Power supply

COMBISTOP requires DC voltage for operation. For the power supply different half-wave or full-wave rectifiers of the series **COMBITRON 98** are available for DC or AC-side switching, which, depending on the type, are suitable for connection voltages up to 720 V AC rated voltage.

The switching characteristics and functions of the **COMBISTOP** can be optimized through the rapid switch rectifier **COMBITRON 98**.