INTORQ

setting the standard

Spring-applied brake BFK457

Compact and easy to mount

0.9 - 92.2 lb-ft

German Design for North American requirements

www.intorq.com/us

We set the standards

The INTORQ brand stands for reliable brake solutions of the highest standard. Whether in electric vehicles, cranes, wind turbines or lift systems – INTORQ products are used in the most diverse of applications. Rely on us to create the right solution for your drive – individually and reliably.

With its broad scope of different versions, the modular range of INTORQ products is used in many motors and geared motors and has set standards worldwide. With the establishment of facilities in Shanghai and Atlanta, we have also consistently expanded our international presence. So wherever you are in the world, our network of sales and service staff is always close at hand to support you.

INTORQ at a glance

- Products: electromagnetic brakes and clutches
- Sales volume $ 60 million per year
- 800,000 units per year
- 86.000 square feet production area
- Development and production in Aerzen
- Companies in Shanghai and Atlanta
- 200 employees
- 63 sales partners in 49 countries
- Certified to DIN ISO 9001 and DIN ISO 14001
- UL, CSA, RU available

INTORQ

BFK457 – compact and easily fitted

Often, the brake is only required to perform its basic function. The BFK457 is ideal for these situations. The speed of mounting with integral fixing screws and fixed air gap make this spring-applied brake even more attractive.

Thanks to the quality standards which we apply to research and development, production and assembly, the INTORQ BFK457 spring-applied brakes meet the highest demands. These electromagnetically released spring-applied brakes can be used wherever rapid deceleration of moving masses or controlled holding of masses is required.

Since the braking force comes from pressure springs, the braking torque, which is generated by friction, is available when no current is applied – even in the event of a mains failure. The brake is released electromagnetically.

Applications

- General engineering
- Engine construction
- Vehicles for the disabled
- Automation technology
- Sport and recreation
- Rotary indexing technology
- Fork lift trucks
- Hoists
- Materials handling technology
- Wood working machines
- Electric vehicles
- Stage and theater (Low-noise design <50 dBA)
- Medical applications (Low-noise design <50 dBA)

Materials handling technology

Industrial trucks

Hoists

Sizes and properties

Sizes 01/02/03/04/05
- Braking torques: 0.09–3 lb-ft (5 sizes)
- **Compact:** Fully assembled with rotor and flange
- Can be mounted on both sides
- Hand release available as an option

Sizes 06/08/10/12/14/16
- Braking torques: 3–92.2 lb-ft (6 sizes)
- Emergency hand release
- Designs:
  Compact: Fully assembled with rotor and flange
  Basic: Stator complete with rotor
- Hand release available as an option

<50 dB(A) noise-reduced brakes (Double spring-applied brakes)
- Sizes 06/08/10/12/14/16
- Braking Torques 2x3 - 2x59 lb-ft
- Emergency hand release

Properties for all sizes
- Standard voltages 24 V DC and 205 V DC (other voltages on request)
- Temperature class F (311 °F)
- Compact design with flange – for small overall dimensions
- Easy assembly by means of integrated fixing screws
- No fixed bearing is required on the brake

Compact, sizes 01 and 02

Compact, sizes 03, 04, 05

Compact, sizes 06 – 16

Basic, sizes 06 – 16

Hand release available as an option

Noise-reduced as a double spring-applied brake <50dB(A)

Contents

List of abbreviations

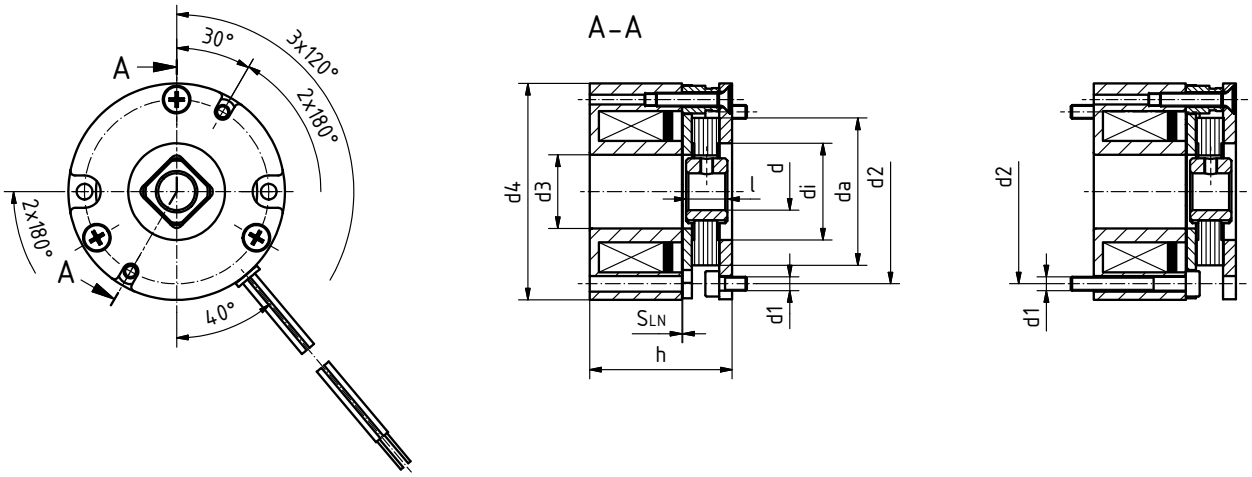
P_N	[W]	Rated coil power at rated voltage and 20°C
U_N	[V DC]	Rated coil voltage
M_K	[lb-ft]	Rated torque of the brake at a relative speed of 100 r/min
Δn_0	[r/min]	Initial relative speed of the brake
Q	[J]	Heat/energy
Q_E	[J]	Maximum permissible friction work per switching cycle, thermal rating of the brake
Q_{smax}	[J]	maximum permissible friction work during cyclic switching, depending on the operating frequency
S_h	[1/h]	Operating frequency, the number of repeated operations per unit time
S_{hmax}	[1/h]	Maximum permissible operating frequency, depending on the friction work per operation
S_{LN}	[in]	Rated air gap
S_{HL}	[in]	Hand-release air gap, setting dimension of hand-release
t_1	[s]	Engagement time, the total of the reaction delay and torque rise time $t_1 = t_{11} + t_{12}$
t_2	[s]	Disengagement time, time from switching the stator until the torque has reduced to 0.1 M_K
t_3	[s]	Slipping time to standstill (after t_{11})
t_{11}	[s]	Delay time when connecting, time from disconnecting the voltage until the torque begins to rise
t_{12}	[s]	Rise time of braking torque, time from beginning of rise of torque until braking torque is reached

Spring-applied brake BFK457-01...05

Sizes 01 and 02

Mounted on flange

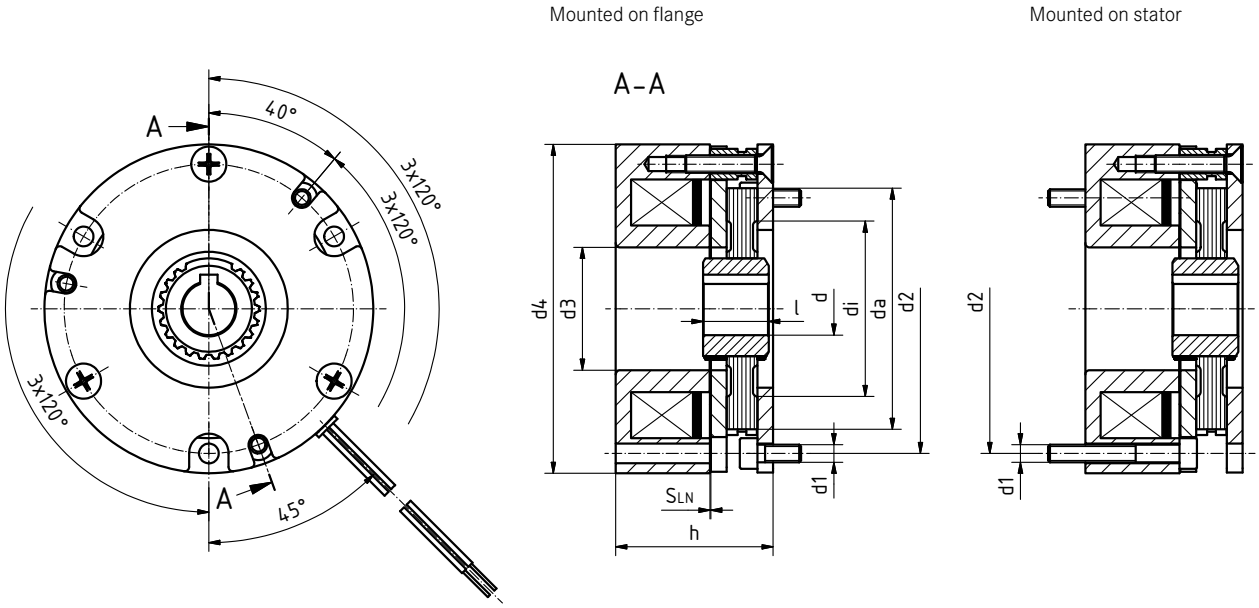
Mounted on stator



Size	M_K	M_{Kmax}	P_N	$d^{H7}{}_{max}$ (2)	d1	d2	d3	d4	da	di	h	l	S_{LN}(4)	$S_{L\ max\ bei\ M_k}$	$S_{L\ max\ at\ M_{kmax}}$	m
01	0.09	0.18	5	1/4 [1]	2xM2,5	1.26	0.53	1.46	0.98	0.71	1.23	0.35	0.0039 $^{+0.0039}_{-0.05}$	0.0138	0.0091	0.44 lb
02	0.18	0.37	6.6	1/4 [1]	2xM3	1.57	0.63	1.85	1.26	0.83	1.22	0.47	0.0059 ±0.0039	0.0138	0.0091	0.55 lb
03	0.37	0.74	9	3/8	3xM3	1.89	0.75	2.2	1.52	1.18	1.25	0.59	0.0059 ±0.0039	0.0154	0.0118	0.9 lb
04	0.74	1.5	11.5	3/8	3xM3	2.28	0.94	2.56	1.87	1.38	1.33	0.59	0.0059 ±0.0039	0.0154	0.0118	1.2 lb
05	1.5	3	13	1/2 (3)	3xM4	2.60	1.10	2.95	2.17	1.54	1.41	0.59	0.0059 ±0.0039	0.0154	0.0118	1.8 lb

- (1) Without keyway
- (2) Standard keyway in accordance with DIN 6885/1-P9
- (3) ∅0.59in, keyway in accordance with DIN 6885/3-P9
- (4) Minimum air gap, the actual value is determined by the sum tolerances of the individual components
- M_K: Rated torque of the brake in lb-ft, based on Δn = 100 rpm
  Caution!: The braking torque depends on the speed
- M_{Kmax}: Holding brake with emergency stop

Sizes 03 to 05

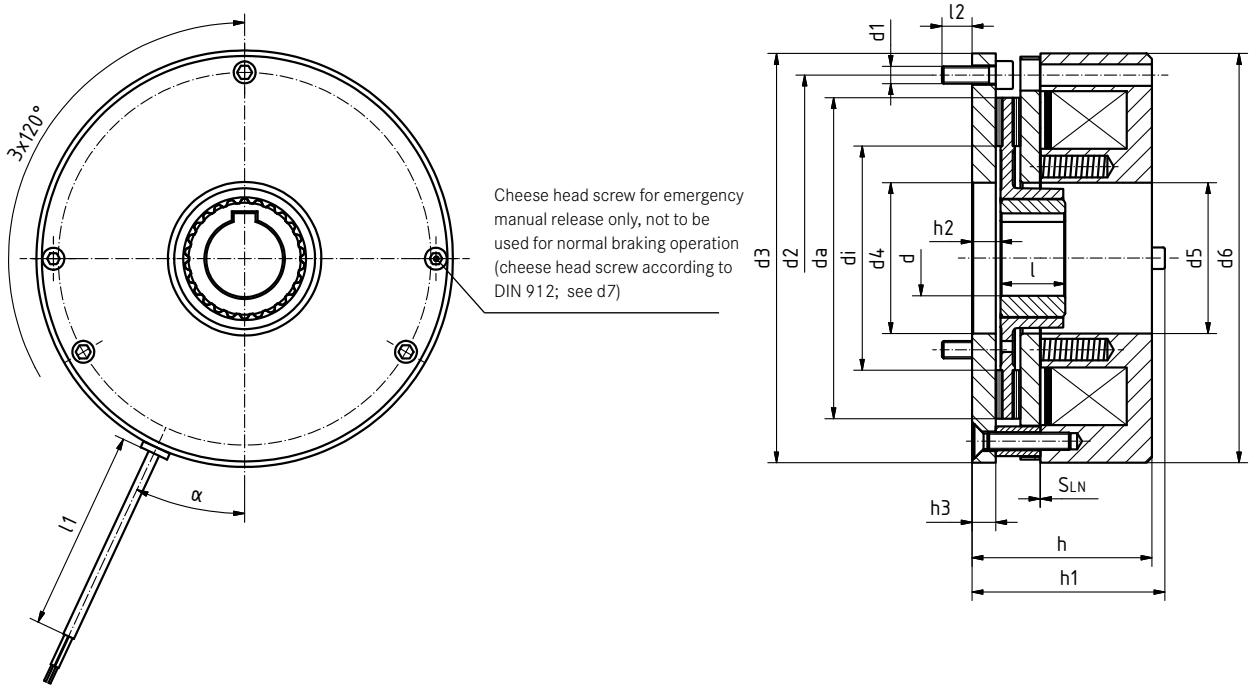


Size	M_K	Max. speed n_{max}	Max. permissible friction work per switching cycle Q_E	Transition operating frequency S_{hue}	Operating times [ms] with standard rated torque and S_{LN} DC switching				Moment of inertia of rotor
								Release	
	[lb-ft]	[rpm]	[Wsec]	[h^{-1}]	t_{11}	t_{12}	t_1	t_2	[lb-in^2]
01	0.09	5000	200	160	2	9	11	17	0.00087
02	0.18	5000	400	125	3	5	8	17	0.00342
03	0.37	5000	800	100	5	7.5	12.5	18	0.00718
04	0.74	5000	1200	90	9	9	18	23	0.01982
05	1.5	5000	1800	80	10	16	26	35	0.03588

- Standard voltages: 24 V DC and 205 V DC, other voltages on request
- Standard keyway according to DIN 6885/1-P9
- Length of connecting cable: 15.74 in
- All dimensions in inch

Spring-applied brake BFK457-06...16

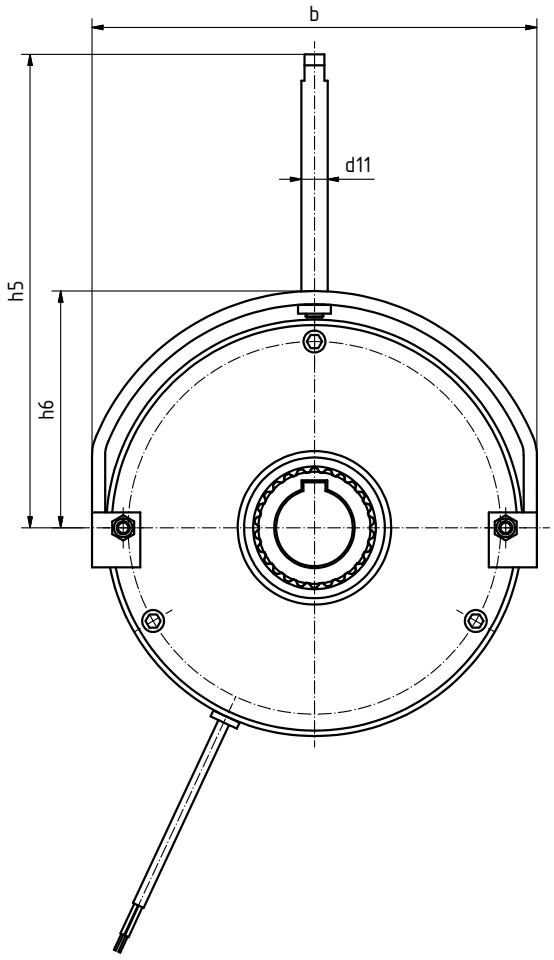
Compact design, fully assembled with rotor and flange

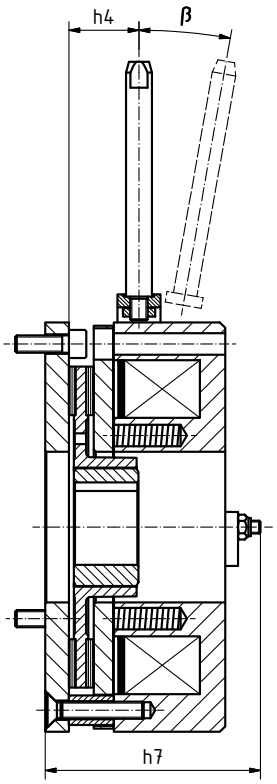


Size	M_K	M_{Kmax}	P_N	b	d^{J7} spec. (1)	d^{H7} max (2)	d1	d2	d3	d4	d5	d6	d7	d11	da	di
06	3	4.4	20	3.54	3/8	5/8	3xM4	2.83	3.31	1.22	1.22	3.03	M4x30	0.31	2.36	1.57
08	5.9	8.9	25	4.25	3/8	3/4	3xM5	3.54	4.02	1.65	1.63	3.68	M5x35	0.31	3.03	1.85
10	11.8	17	30	5.39	3/8	3/4	3xM6	4.41	5.12	1.73	1.73	4.61	M5x40	0.39	3.74	2.60
12	23.6	33.9	40	6.18	9/16	1	3XM6	5.20	5.81	2.05	2.05	5.37	M5x45	0.39	4.53	2.76
14	44.3	66.4	50	6.85	9/16	1 1/8	3XM8	5.71	6.50	2.17	2.36	5.91	M6x55	0.47	4.89	3.15
16	59	92.2	55	7.99	5/8	1 3/8 (3)	3xM8	6.69	7.48	2.76	2.76	6.87	M6x60	0.47	5.87	4.09

Size	M_K	Max. speed n_{max}	Max. permissible friction work per switching cycle Q_E	Transition operating frequency S_{hue}	Operating times [ms] with standard rated torque and $S_{LN\ Nenn}$ DC switching			Release	Moment of inertia of rotor
	[lb-ft]	[rpm]	[Wsec]	[h^{-1}]	t_{11}	t_{12}	t_1	t_2	[lb-in^2]
06	3	6000	3000	79	29	19	48	37	0.044
08	5.9	5000	7500	50	60	35	95	42	0.154
10	11.8	4000	12000	40	35	60	95	100	0.683
12	23.6	3600	24000	30	45	53	98	135	1.538
14	44.3	3600	30000	28	50	57	107	240	2.152
16	59	3600	36000	27	71	50	121	275	5.228

Compact design, with hand release



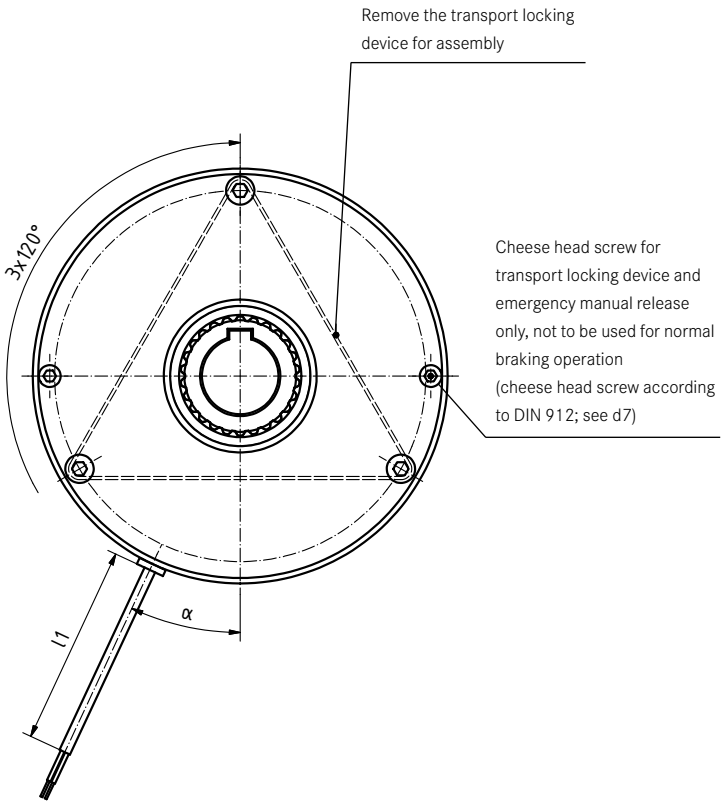


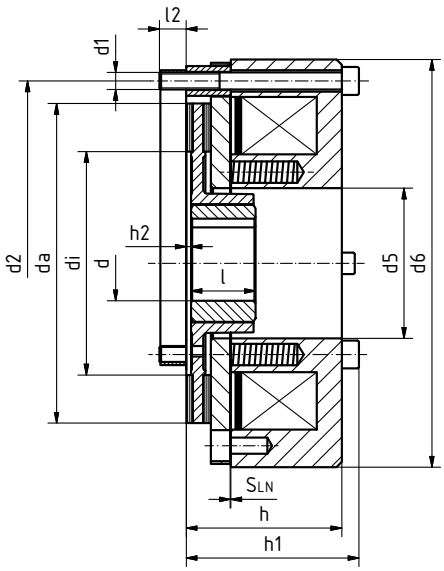
Size	h	h1	h2	h3	h4	h5	h6	h7	l	l1	l2 (4)	S_{LN} ± 0.0039	S_{Lmax} at M_K	S_{Lmax} at M_{Kmax}	α	β	m [lb]
06	1.61	1.78	0.27	0.23	0.62	4.21	1.93	1.96	0.70	15.7	0.24	0.0079	0.0236	0.0154	25°	10°	2.5
08	1.96	2.16	0.34	0.27	0.64	4.64	2.32	2.25	0.79	15.7	0.35	0.0079	0.0236	0.0177	25°	10°	4.2
10	2.20	2.42	0.39	0.31	1.07	5.60	2.91	2.57	0.79	15.7	0.47	0.0118	0.0276	0.0197	25°	10°	8.4
12	2.44	2.65	0.39	0.31	1.15	6.38	3.30	2.80	0.98	15.7	0.47	0.0118	0.0315	0.0197	25°	10°	12.6
14	3.03	3.28	0.51	0.43	1.30	7.91	3.70	3.50	1.18	15.7	0.55	0.0118	0.0315	0.0197	25°	10°	19.0
16	3.30	3.52	0.53	0.43	1.47	9.84	4.25	3.93	1.18	23.6	0.55	0.0118	0.0354	0.0236	25°	10°	26.5

- (1) Pilot bored without keyway
- (2) Standard keyway in accordance with DIN 6885/1-P9
- (3) ∅1.50in, keyway in accordance with DIN 6885/3-P9
- (4) Please contact the manufacturer if a different mounting surface made from steel is used
- Standard voltages: 24 V DC and 205 V DC, other voltages on request
- M_K: Rated torque of the brake in lb-ft, based on Δn = 100 rpm
  Caution!: The braking torque depends on the speed
- M_{Kmax}: Holding brake with emergency stop
- All dimensions in inch

Spring-applied brake BFK457-06...16

Basic design: Stator complete with rotor

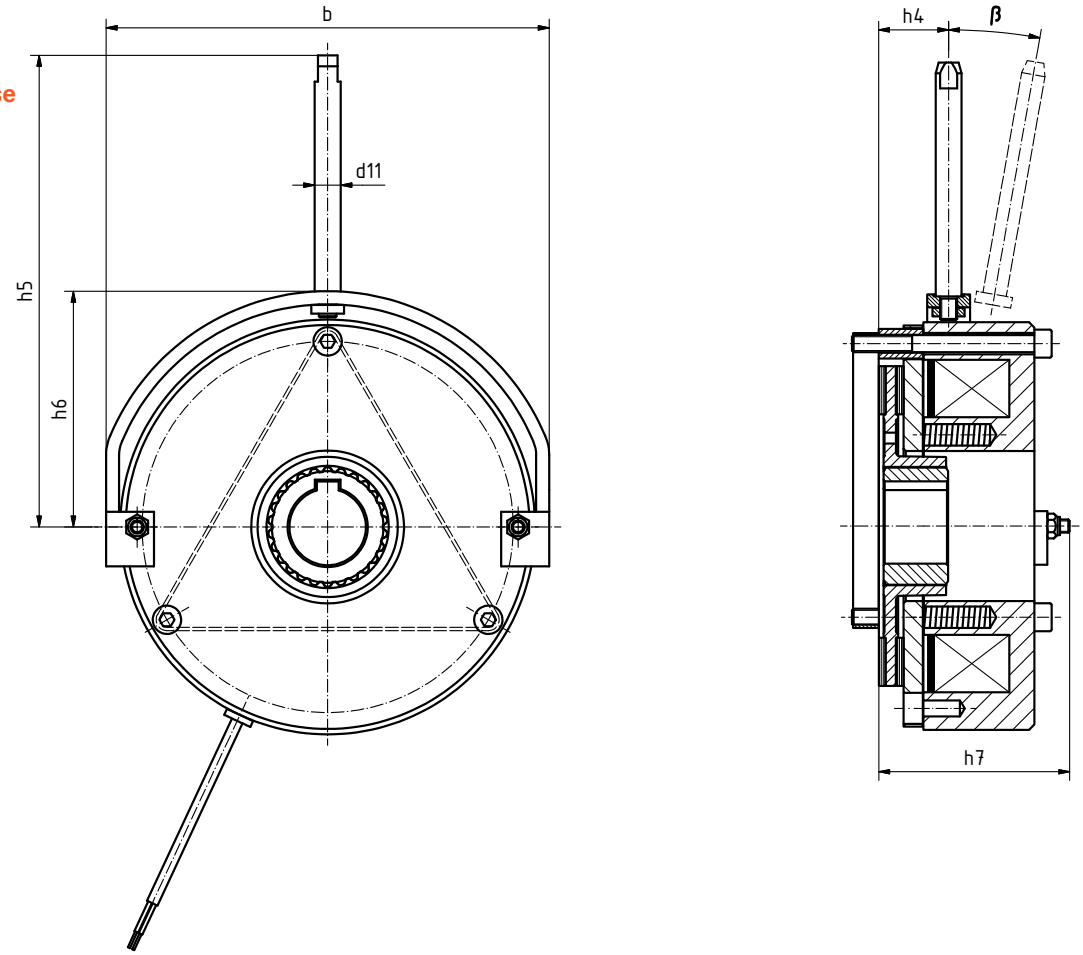




Size	M_K	M_{Kmax}	P_N	b	d^{J7} spec. (1)	d^{H7} max (2)	d1	d2	d5	d6	d7	d11	da	di
06	3	4.4	20	3.54	3/8	5/8	3xM4	2.83	1.22	3.30	M4x30	0.31	2.36	1.57
08	5.9	8.9	25	4.25	3/8	3/4	3xM5	3.54	1.24	4.01	M5x35	0.31	3.03	2.24
10	11.8	17	32	5.39	3/8	3/4	3xM6	4.41	1.73	5.11	M5x40	0.39	3.74	2.60
12	23.6	33.9	40	6.18	9/16	1	3XM6	5.20	2.05	5.90	M5x45	0.39	4.53	2.76
14	44.3	66.4	53	6.85	9/16	1 1/8	3XM8	5.71	2.36	6.50	M6x55	0.47	4.88	3.15
16	59	92.2	55	7.99	5/8	1 3/8 (3)	3xM8	6.69	2.76	7.48	M6x60	0.47	5.87	4.09

Size	M_K	Max. speed n_{max}	Max. permissible friction work per switching cycle Q_E	Transition operating frequency S_{hue}	Operating times [ms] with standard rated torque and $S_{LN\ Nenn}$ DC switching			Release	Moment of inertia of rotor
	[lb-ft]	[rpm]	[Wsec]	[h^{-1}]	t_{11}	t_{12}	t_1	t_2	[lb-in^2]
06	3	6000	3000	79	29	19	48	37	0.044
08	5.9	5000	7500	50	60	35	95	42	0.154
10	11.8	4000	12000	40	35	60	95	100	0.683
12	23.6	3600	24000	30	45	53	98	135	1.538
14	44.3	3600	30000	28	50	57	107	240	2.153
16	59	3600	36000	27	71	50	121	275	5.123

Basic design, with hand release

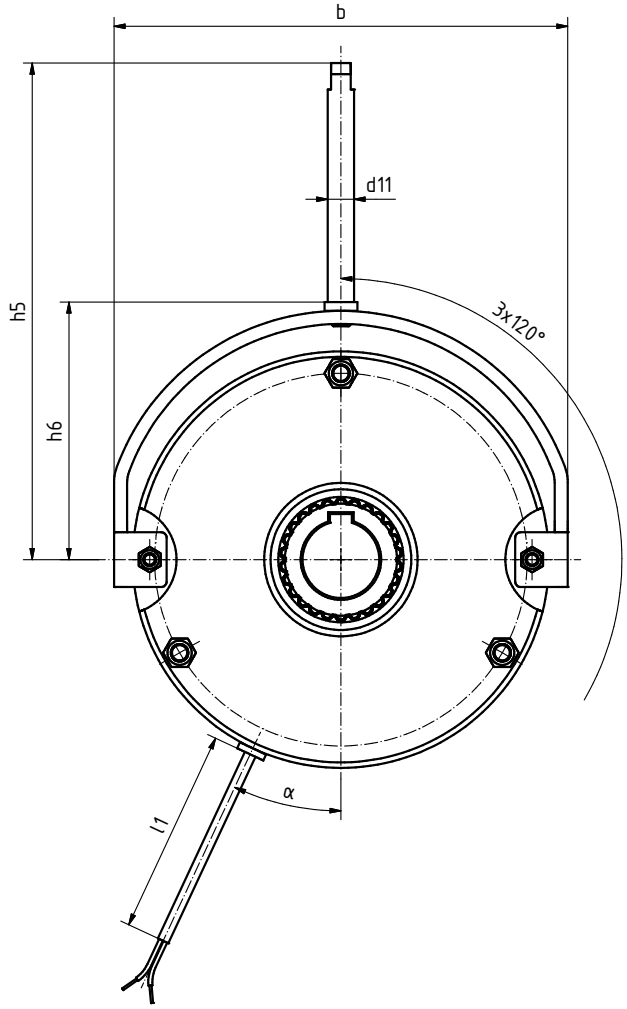


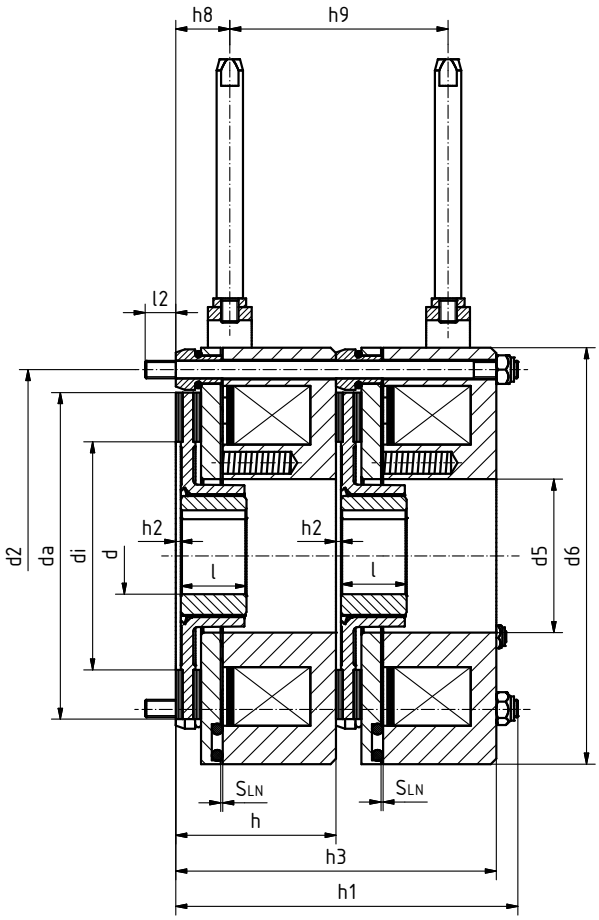
Size	h	h1	h2	h4	h5	h6	h7	l	l1	l2 (4)	S_{LN} ± 0,0039	S_{Lmax} at M_K	S_{Lmax} at M_{Kmax}	α	β	m [lb]
06	1.38	1.53	0.04	0.62	4.21	1.92	1.72	0.70	15.7	0.38	0,0079	0,0236	0.0154	25°	10°	2.0
08	1.68	1.88	0.06	0.64	4.64	2.32	1.97	0.78	15.7	0.48	0,0079	0,0236	0.0177	25°	10°	3.3
10	1.90	2.15	0.08	1.08	5.59	2.91	2.25	0.78	15.7	0.45	0,0118	0,0276	0.0197	25°	10°	6.6
12	2.14	2.36	0.08	1.16	6.38	3.30	2.49	0.98	15.7	0.43	0,0118	0,0315	0.0197	25°	10°	10.4
14	2.61	2.91	0.08	1.30	7.91	3.70	3.07	1.18	15.7	0.55	0,0118	0,0315	0.0197	25°	10°	15.7
16	2.85	3.17	0.09	1.48	9.84	4.25	3.50	1.18	23.6	0.49	0,03	0,0354	0.0236	25°	10°	22

- (1) Pilot bored without keyway
- (2) Standard keyway in accordance with DIN 6885/1-P9
- (3) ∅1.50in, keyway in accordance with DIN 6885/3-P9
- (4) Please contact the manufacturer if a different mounting surface made from steel is used
- Standard voltages: 24 V DC and 205 V DC, other voltages on request
- M_K: Rated torque of the brake in lb-ft, based on Δn = 100 rpm
  Caution!: The braking torque depends on the speed
- M_{Kmax}: Holding brake with emergency stop
- Dimensions in inch

Double spring-applied brake BFK457-06...16

Low-noise design < 50 dB(A)





Size	M_K	P_N	b	d^{J7} spec. (1)	d^{H7} max (2)	d1	d2	d5	d6	d11	da	di	h	h1
06	2x3	20	3.54	3/8	5/8	3xM4	2.83	1.22	3.30	0.31	2.36	1.57	1.39	2.97
08	2x5.9	25	4.25	3/8	3/4	3xM5	3.54	1.63	4.01	0.31	3.03	2.24	1.69	3.56
10	2x11.8	30	5.39	3/8	3/4	3xM6	4.41	1.73	5.11	0.39	3.74	3.0	1.91	4.05
12	2x23.6	40	6.18	9/16	1	3XM6	5.20	2.05	5.90	0.39	4.53	2.76	2.14	4.31
14	2x44.3	50	6.85	9/16	1 1/8	3XM8	5.71	2.36	6.50	0.47	4.88	3.15	2.61	5.25
16	2x59	55	7.99	5/8	1 3/8 (3)	3xM8	6.69	2.76	7.48	0.47	5.87	4.09	2.85	5.72

- (1) Pilot bored without keyway
- (2) Standard keyway in accordance with DIN 6885/1-P9
- (3) ∅1.50in, keyway in accordance with DIN 6885/3-P9
- (4) Please contact the manufacturer if a different mounting surface made from steel is used
- Standard voltages: 24 V DC and 205 V DC, other voltages on request
- M_K: Rated torque of the brake in lb-ft, based on Δn = 100 rpm
  Caution!: The braking torque depends on the speed
- M_{Kmax}: Holding brake with emergency stop
- Dimensions in inch

General Information

INTORQ brakes are designed so that the stated rated torques are reliably attained after a short run-in operation.

Given the fluctuating properties of the organic friction linings used and changing environmental conditions, there may however be deviations from the stated braking torques. Appropriate safety factors in the design must take this into account.

An increased breakaway torque may in particular be experienced in damp conditions and with changing temperatures after long downtimes.

The braking torque should be checked when using the brake on the customer's friction surfaces. If the brake is being used solely as a holding brake without any dynamic load, the friction lining must be reactivated regularly.

Features

- Basic design without flange
- Noise-reduced armature plate
- Noise-reduced aluminium rotor
- Easy to assemble thanks to integrated fixing screws for direct mounting
- The brake is delivered in parts

Size	h2	h3	h5	h6	h8	h9	l	l1	l2 (4)	S_{LN} ± 0,0039	S_{Lmax} at M_K	α	m [lb]
06	0.04	2.79	4.29	2.13	0.51	1.73	0.24	15.7	0.24	0,0079	0.0197	25°	4.2
08	0.06	3.38	4.79	2.44	0.50	2.49	0.35	15.7	0.35	0,0079	0.0197	25°	7.1
10	0.08	3.81	5.79	3.31	0.63	2.76	0.35	15.7	0.43	0.0118	0.0197	25°	14.1
12	0.08	4.29	6.54	3.66	0.72	3.09	0.43	15.7	0.43	0.0118	0.0295	25°	21.6
14	0.08	5.23	7.32	4.17	0.87	3.60	0.55	15.7	0.55	0.0118	0.0295	25°	32.6
16	0.09	5.70	9.05	4.74	0.96	3.94	0.55	23.6	0.55	0.0118	0.0295	25°	46.3

Model overview

Spring-applied brake BFK457

Size

☐ 01 ☐ 02 ☐ 03 ☐ 04 ☐ 05

Compact: Fully assembled with rotor and flange

☐ 06 ☐ 08 ☐ 10 ☐ 12 ☐ 14 ☐ 16

- **Basic:** Stator with rotor
- **Compact:** Fully assembled with rotor and flange
- **Noise-reduced:** Double spring-applied brake in low-noise design <50 dB(A)

Spannung

☐ 24 V DC ☐ 205 V DC (other voltages on request)

Braking torque

01	02	03	04	05	06	08	10	12	14	16
0.09	0.18	0.37	0.74	1.5	3	5.9	11.8	23.6	44.3	59
0.18	0.37	0.74	1.5	3	4.4	8.9	17	34	66.4	92.2

Hand release

☐ Assembled

Hub

☐ Bore diameter in inch (see technical data, tables)

Compact, sizes 01 and 02

Hand release available as an option

Noise-reduced as a double spring-applied brake <50dB(A)

We are available to our customers at all times and all locations. Major customers and projects are supported directly by our Key Account Sales Team at our HQ in Aerzen (Germany) or by our locations in Shanghai (China) and Atlanta (USA).

In addition to this, we work with a global network of local trading partners.

Please send service requests directly to your local sales partner or to our HQ in Aerzen, Germany:

E-mail service@intorq.de
Tel: +49 5154 705 34-444
Fax: +49 5154 705 34-200

You can find more information on our products, as well as catalogues and operating instructions available for download on our website at www.intorq.com/us

INTORQ locations and trading partners throughout the world

INTORQ US INC.
USA

300 Lake Ridge Drive SE
Smyrna, GA 30082, USA

Tel: 678 309-1155
Fax: 678 309-1157
E-mail info@us.intorq.com

www.intorq.com/us