Drum brakes with electrohydraulic thrustor of ZE or EB type and with the electromagnetic thrustor of DZEMz type are adjusted to cooperation with brake drums on their external surface. The braking torque is created by the spring inbuilt in the thrustor body (AHH, AHG) or in the compound lever (AHH series 300, AHM), which through the compound lever causes pressing down the brake shoe with friction lining to the friction surface of the brake drum (with the exception of holding brake AHT).

BRAKES WITH ELECTROHYDRAULIC THRUSTOR

Turning the voltage supplying the thrustor on starts the motor and the pump forcing the oil under the piston of the release , which causes that the piston moves up and the brake is thrustord (with the exception of the holding brake). Turning off the power causes that the piston moves down (under the influence of the spring in the thrustor) and the brake is applied.

The value of the braking torque can be adjusted through the change of brake position on appropriate lever.

The speed of falling or raising the piston can be adjusted through the use of the valve delaying falling or raising of the piston.

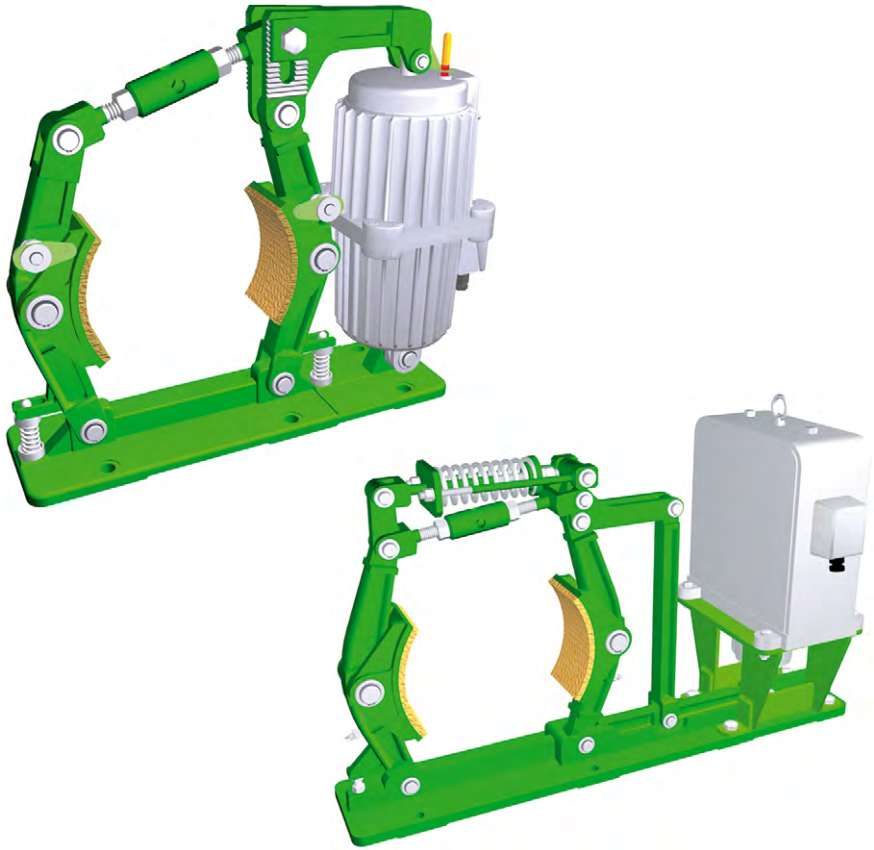
VARIANTS:

- **AHH** – standard
- **AHH (series 300)** – with outer spring
- **AHH (series 400)** – with increased braking torque
- **AHG** – mining
- **AHT** – holding; the brake of reverse operation, the thrustor spring releases the brake and turning on and maintaining the supply of the thrustor causes applying the brake
- **AHC** – loading: the usage of the thrustor without the braking spring, braking torque is created by additional weights placed on the lever
- **AHR** – with a manual mechanism

BRAKES WITH ELECTROMAGNETIC THRUSTOR – AHM

Turning the voltage supplying the thrustor on starts the electromagnet of the thrustor, which pulls the piston up causing through the compound lever the brake release.

The value of the braking torque can be adjusted through the change of braking spring deflection. Brakes with electromagnetic thrustor can be produced in the type intended for operation in the areas with the danger of explosion.



WORKING CONDITIONS

The brake is designed for work in moderate climate, on the ground. When working outdoor, it is recommended to cover the brake against direct precipitation. Basically, the brake is designed for work in the horizontal position (the base is fitted to the horizontal surface). Work in the position deflected from vertical position is possible only after consultation with the manufacturer.

APPLICATIONS: belt conveyors, fans, drives of cranes, devices of continuous transport, machines for iron and steel, building, papermaking and other industries.

MATERIAL: brake construction – spheroidal iron cast, steel; asbestos-free friction lining; ZE thrustor body – aluminium, ExZE – iron cast, DZEMz – steel; bolts from stainless steel).

OPERATION IN THE AREAS WITH THE DANGER OF EXPLOSIONS:
Mining brakes are intended for the operation in the areas with the danger of explosion in the conditions specified for (group: I M2, II 2D, II 2G).

ELECTROHYDRAULIC THRUSTORS (AHH, AHT AND AHC BRAKES)
Version N/1 – for outdoor use in a temperate climate.
The thrustor has an oil-tight housing with a junction box with IP 65 rating according to PN-EN 60529:2003. The thrustor in the standard version is designed for operation in the vertical position and a position deviated from vertical by a 30° angle.

Conditions of operation: ambient temperature: –25°C to +40°C (electroinsulating transformer oil); –40°C to +50°C (silicone oil).

VERSIONS:

- **ZE...** thrustor without brake spring [Type of operation S1, S3 do 100% 2000 c/h]
- **ZE...S...** thrustor with the brake spring, [operating mode S1, S3 to 100% 2000 c/h]
- **ZEW...(S)...** thrustor with the brake spring and connector (allows to signal the upper piston rod position) [operating mode S1, S3 do 100% 2000 c/h]
- **ZEM...(S)...** thrustor with the brake spring and electromagnet (maintains the piston in its upper position without necessity of supplying the thrustor motor) [type of work S1, S3 40% 600 c/h] 38 V DC electromagnet supply voltage, current intensity of 0,4–0,45 A for size thrustor smaller than ZEM 2500 and 38V DC and 0,8 A for size ZEM 2500 and ZEM 3200
- **ZE…(S)…Cm** thrustor equipped with an external mechanical switch (PDM1F12PZ11) with a NO/NC contact system. This switch, depending on the position of the measuring slide, can indicate whether the piston rod is in the upper or lower position. After consultation, indication of a different piston rod position is also possible.

  Technical details of the mechanical switch:
  AC-15 and DC-13 utilisation categories
  Rated operational voltage: AC:24/120/240V 50/60Hz,
  DC: 24/125/250 V
  Rated operational currents: AC:10/6,3/1,8 A, DC: 2,8/0,55/0,27 A
  Contact system: NO/NC
  IP 66 rating
- **ZE…(S)…Ci-…** A thrustor equipped with an inductive sensor located on the outside. This sensor can indicate the position of the piston rod over its entire extension range. The position of the piston rod can be deter mined at any point using a sliding measuring head.

  Technical details of the inductive sensor:
  Supply voltage: from 12 to 24 VDC
  Current: 10 mA max

Marking	Sensor type	Operation method	Output type
B1	E2A-M18-KS08-M1-B1	NO	PNP
C1	E2A-M18-KS08-M1-C1	NO	NPN
B2	E2A-M18-KS08-M1-B2	NC	PNP
C2	E2A-M18-KS08-M1-C2	NC	NPN

Versions with delay valves:
ZE.. P..... – with a lifting delay valve
ZE.. O..... – with a falling delay valve
ZE.. T..... – with a lifting and falling delay valve

S1 – Operation continuous, S3 – Operation discontinuous)

For the supply of brakes with ZEM thrustor, a suitable UZ power supply system supplied with alternating current, which allows an electromagnet to be connected to it, may be provided.

EXPLOSION-PROOF ELECTROHYDRAULIC THRUSTOR (AHG Brakes)
The thrustor is made as an explosion-proof device in a flameproof casing with intrinsically safe signalling circuits and a connection box with IP 65 rating according to PN-EN 60529:2003.

The thrustor in the standard version is designed for operation in the vertical position and a position deviated from vertical by a 30° angle.
The thrustor is equipped with a limit switch which can be used to indicate the movement of the piston rod to its upper extreme position.

Ambient temperature: from –20°C to +40°C.

VERSIONS:
- **ExZE...S...** thrustor with the brake spring [Type of operation S1,S3 to 100% 2000c/h]
- **ExZEM...S...** thrustor with the brake spring and electromagnet (maintains the piston in upper position without necessity of supplying the thrustor motor – supply voltage of the electromagnet 42 VAC) * Type of operation S1, S3 to 40% 600 c/h]

The thrustors are intended for the operation in the areas with the danger of explosion in the conditions specified for group I M2, II 2D, II 2G.
The thrustors can be manufactured with the connector with **"r"** (NC) opening contact or **"z"** (NO) closing contact and thermal Protection in the form of bimetallic switch **"1"** or posistor sensor **"2"**.

ELECTROMAGNETIC THRUSTOR (AHG Brakes)
Electromagnetic thrustors of DZEMz type are produced for continuous operation S1 and discontinuous operation S3–40.
Conditions of operation: grade of protection IP 40; ambient temperature: –15°C to +35°C.

METHOD OF MARKING:

[**name**] – [**D_H**] – [**thrustor marking**] – [**size**][**type**] – [**version***]

* only when it concerns a given type, where:

name	e.g. drum brake
D_H	diameter of the brake drum [mm]
thrustor marking	*see on the next page*
size	e.g. 264
type	e.g. AHH
version	WS… – special (individual arrangements) K – lining wear compensation version

METHOD OF THRUSTOR MARKING:

ZE TYPE

[version] – [delay valve*] – [size] / [stroke][spring*] · [oil*] · [voltage] [sensor*]

* only when it aplies

version ZE – basic
ZEW – with connector
ZEM – with electromagnet

delay valve without the valve – omit the marking
P – lifting
O – falling
T – lifting and falling

thrustor size e.g. 1250
thrustor stroke e.g. 60
spring e.g. S 450
oil normally transformer oil (omit the marking); SIL – silicone oil
voltage e.g. 500 V AC/50 Hz
sensor marking (if required) – e.g. inductive B1 –"Ci-B1", mechanical "Cm"

ExZE TYPE

[version] – [size] / [stroke][connection][protection][spring*] · [voltage]

* only when it aplies

version ExZE – basic
ExZEM – with electromagnet

thrustor size e.g. 1250
thrustor stroke e.g. 60
contact "r" – opening, "z" – closing

protection bimetallic switch "1", posistor sensor "2"
spring e.g. S 450
voltage e.g. 500 V AC/50 Hz

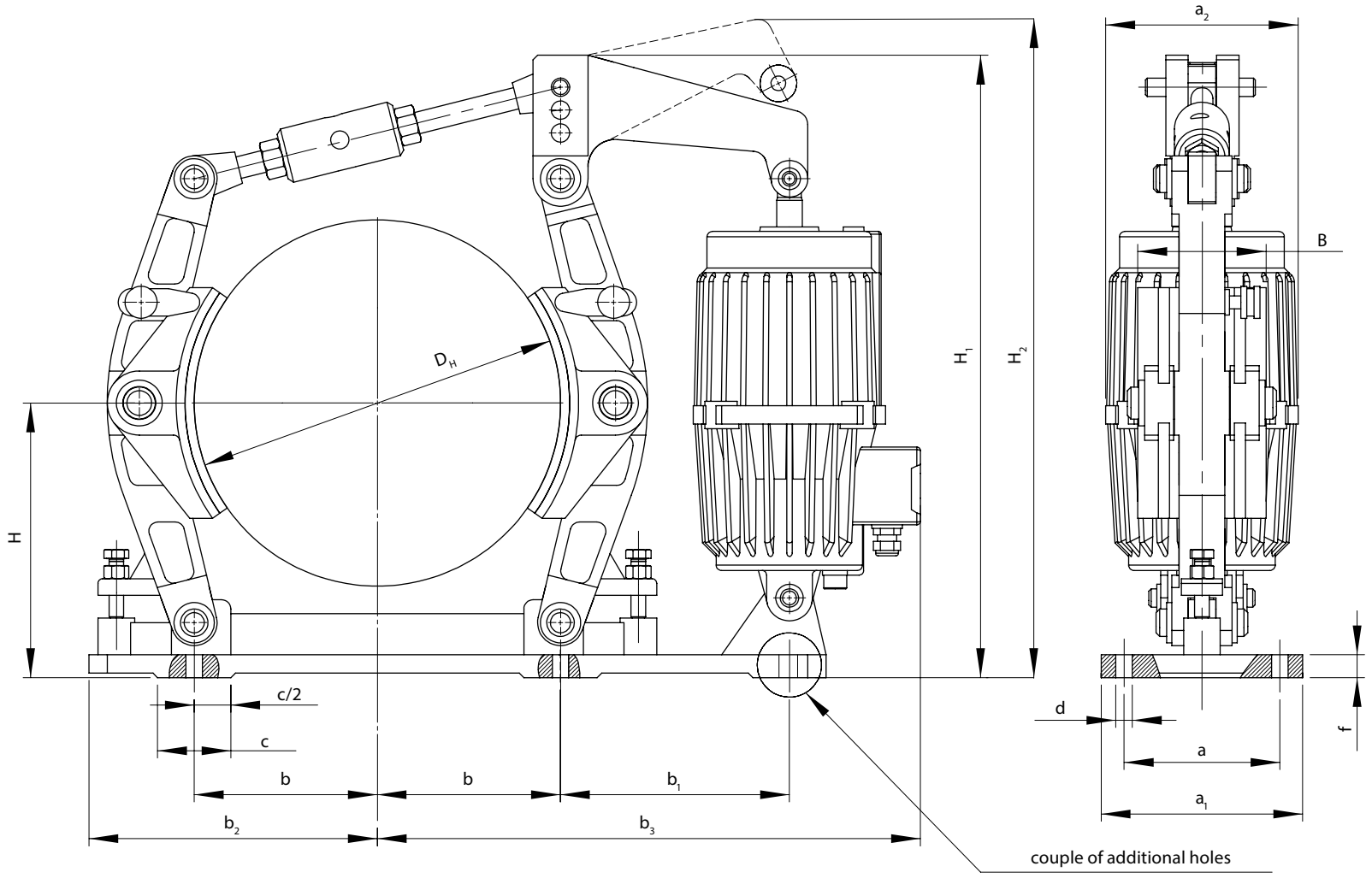
DZEMz TYPE

[version][size] – [operation] – [voltage]

* only when it aplies

version DZEMz
thrustor size e.g. 20
type of operation S1 – continuous, S3–40 – discontinuous
voltage e.g. 500 V AC/50 Hz

Example of designation of the AHH brake with the drum diameter of D_H=250 with the ZE 500/50 S500. 400 V AC/50 Hz electrohydraulic thrustor, size of 264 *(marking see page B1-3)*:
250-ZE 500/50 S500.400 V AC/50 Hz-264 AHH Drum brake



TECHNICAL CHARACTERISTICS

Brake drum diameter D_H	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz	Brake weight with thrustor [3]	Brake size and type
mm	Nm	–	V	kg	–
120	20÷50	ZE 120/50-2 S 120	3×230 3×400 3×500	21	261 AHH
160	50÷100	ZE 120/50-2 S 220		26	262 AHH
	80÷160	ZE 500/50 S 320 ZEW 500/50 S 320 ZEM 500/50 S 320 [1]		31	
200	90÷190	ZE 500/50 S 320 ZEW 500/50 S 320 ZEM 500/50 S 320 [1]		44	263 AHH
250	190÷365	ZE 500/50 S 500 ZEW 500/50 S 500 ZEM 500/50 S 500 [1]		52	264 AHH
320	310÷590	ZE 500/50 S 500 ZEW 500/50 S 500 ZEM 500/50 S 500 [1]		85	265 AHH
400	580÷1160	ZE 1250/60 S 800 ZEW 1250/60 S 800 ZEM 1250/60 S 800 [1]		98	266 AHH
500	1000÷1570	ZE 1500/60 S 1250 ZEW 1500/60 S 1250		156	267 AHH
	1600÷2500	ZE 2500/60 S 2000 ZEW 2500/60 S 2000 ZEM 2500/60 S 2000 [1]		168	
630	2300÷4000	ZE 2500/60 S 2000 ZEW 2500/60 S 2000 ZEM 2500/60 S 2000 [1]		255	268 AHH
710	3100÷5000	ZE 2500/60 S 2000 ZEW 2500/60 S 2000 ZEM 2500/60 S 2000 [1]		354	269 AHH
800	4800÷7000	ZE 3200/80 S 2500 ZEW 3200/80 S 2500 ZEM 3200/80 S 2500 [1]		440	270 AHH

We are also offering tailor-made special versions.

[1] When utilising the ZEM... type thrustor it is necessary to provide electromagnet supply (38 V DC, current intensity of 0,4 A, for ZEM 500, 0,45 A for ZEM 800 and ZEM 1500; 0,8 A for thrustor ZEM 2500 and ZEM 3200).

[2] Thrustor with different voltage rating and frequency can be made after consultation.

[3] Brake weight with oil thrustor.

DIMENSIONS

Brake shoe width B	H	H_1	H_2	b	b_1	b_2	b_3	a	a_1	a_2	c	d	f	Brake size and type
mm														–
40	110	360	410	55	160	115	395	75	105	162	50	14	12	261 AHH
50	130	420 [1)] 457	430 [1)] 505	80	190	145	395 [1)] 375	75	120	162 [1)] 180	60	14	12	262 AHH
70	180	470	505	95	140	190	405	90	130	180	60	18	15	263 AHH
90	220	515	575	120	170	215	440	120	160	180	80	18	15	264 AHH
110	250	585	600	160	220	280	515	140	190	180	80	18	20	265 AHH
140	300	680	690	200	250	315	593	170	220	210	80	18	25	266 AHH
180	360	820	830	250	280	380	673	200	270	210 [2)] 254	80	22	25	267 AHH
225	450	1025	1035	325	280	475	762	230	300	254	100	22	30	268 AHH
255	500	1210	1220	370	365	500	892	260	320	254	100	23	30	269 AHH
280	560	1275	1285	400	400	580	960	280	360	254	120	33	40	270 AHH

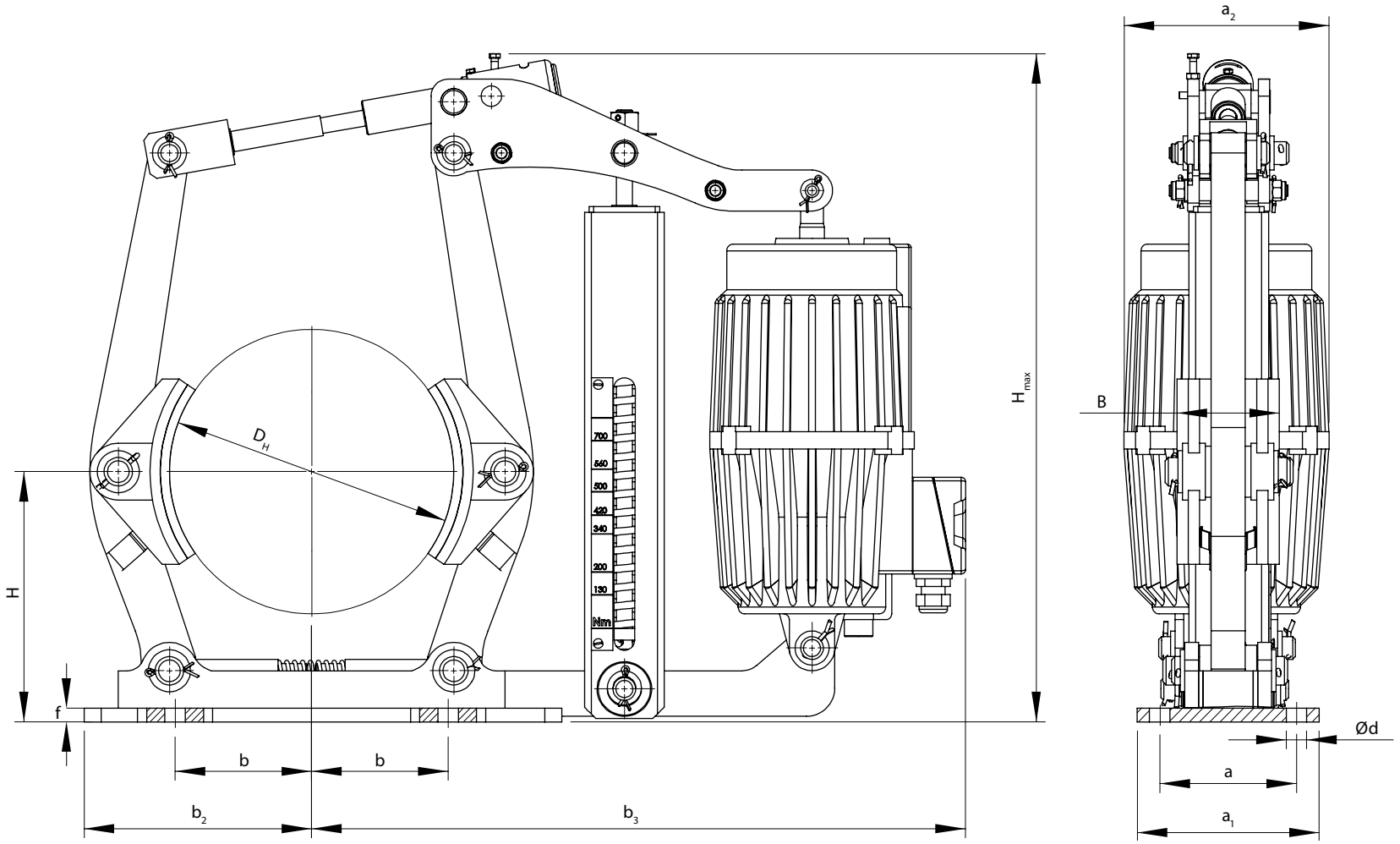
We are also offering tailor-made special versions.

[1)] size 262 AHH: dimensions of the brake with the ZE 120/50-2 S 220 thrustor

[2)] size 267 AHH: dimensions of the brake with the ZE 1500/60 S 1250 and ZEW 1500/60 S 1250 thrustors

Example of designation of the AHH brake series 300 with the drum diameter of D_H=250 with the ZE 500/50. 400 V AC/50 Hz electrohydraulic thrustor, size of 364 *(marking see page B1-3)*:
250-ZE 500/50.400 V AC/50 Hz-364 AHH Drum brake

- in a "K" lining wear compensation version –
  250-ZE 500/50.400 V AC/50 Hz-364 AHH-**K** Drum brake



Brake drum diameter D_H	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz	Brake shoe width B	H	H_{max}	b	b_2	b_3	a	a_1	a_2	d	f	Brake weight with thrustor [3]	Brake size and type
mm	Nm	–	V	mm											kg	–
200	100÷430	ZE 500/50 ZEW 500/50 ZEM 500/50 [1]		70	180	500	95	190	480	90	130	180	18	10	41	363 AHH
250	100÷660	ZE 500/50 ZEW 500/50 ZEM 500/50 [1]		90	220	600	120	210	530	120	160	180	18	12	50	364 AHH
320 (315)	200÷1000	ZE 500/50 ZEW 500/50 ZEM 500/50 [1]		110	250	690	160	270	605	140	190	180	18	12	67	365 AHH
400	500÷1800	ZE 1250/60 ZEW 1250/60 ZEM 1250/60 [1]		140	300	790	200	315	700	170	220	210	18	20	110	366 AHH
500	300÷3000	ZE 1500/60 ZEW 1500/60 ZEM 1500/60 [1]	3×230 3×400 3×500	180	360	850	250	407	840	200	270	254	22	20	155	367 AHH
	300÷5100	ZE 2500/60 ZEW 2500/60 ZEM 2500/60 [1]													170	
630	500÷6300	ZE 2500/60 ZEW 2500/60 ZEM 2500/60 [1]		225	450	1035	325	465	925	230	300	254	22	30	248	368 AHH
710	500÷6800	ZE 2500/120 ZEW 2500/120 ZEM 2500/120 [1]		255	500	1280	370	500	1000	260	320	254	23	30	360	369 AHH
800	500÷8500	ZE 3200/100 ZEW 3200/100 ZEM 3200/100 [1]		280	560	1350	400	580	1075	280	360	254	33	35	440	370 AHH

We are also offering tailor-made special versions.

[1] When utilising the ZEM... type thrustor it is necessary to provide electromagnet supply (38 V DC, current intensity of 0,4 A, for ZEM 500, 0,45 A for ZEM 800 and ZEM 1500; 0,8 A for thrustor ZEM 2500 and ZEM 3200).

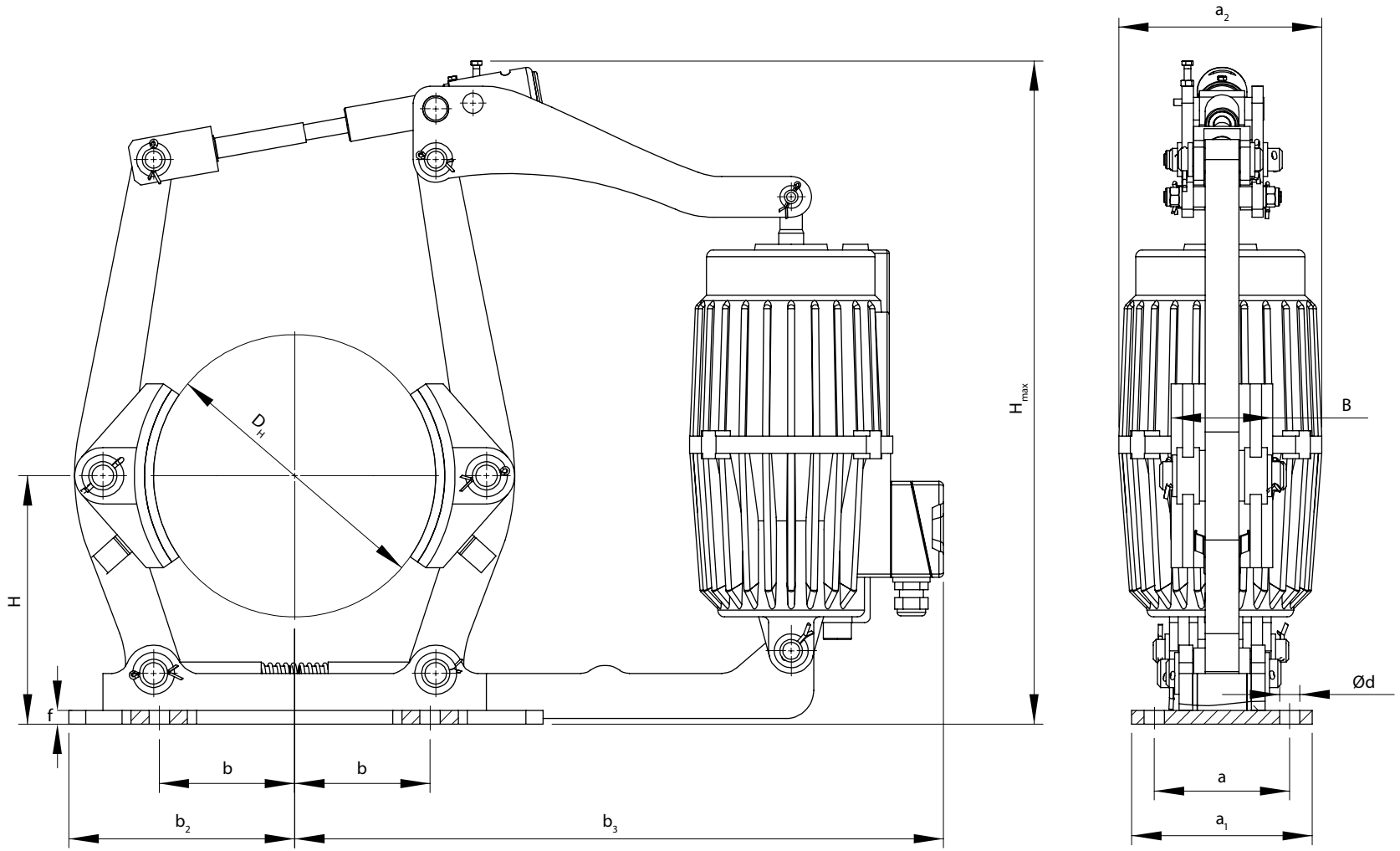
[2] Thrustors with different voltage rating and frequency can be made after consultation.

[3] Brake weight with oil thrustor.

Example of designation of the AHH brake series 400 with the drum diameter of D_H=250 with the ZE 500/50 S500. 400 V AC/50 Hz electrohydraulic thrustor, size of 463 *(marking see page B1-3)*:

250-ZE 500/50 S500.400 V AC/50 Hz-463 AHH Drum brake

- in a "K" lining wear compensation version –
  250-ZE 500/50 S500.400 V AC/50 Hz-463 AHH-**K** Drum brake



Brake drum diameter D_H	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz	Brake shoe width B	H	H_{max}	b	b_2	b_3	a	a_1	a_2	d	f	Brake weight with thrustor [3]	Brake size and type
mm	Nm	–	V	mm											kg	–
200	140÷280	ZE500/50 S320 ZEW 500/50 S320 ZEM500/50 S320 [1]	3×230 3×400 3×500	70	180	500	95	190	480	90	130	180	18	10	36	463 AHH
	225÷430	ZE500/50 S500 ZEW 500/50 S500 ZEM500/50 S500 [1]														
250	300÷660	ZE500/50 S500 ZEW 500/50 S500 ZEM500/50 S500 [1]		90	220	600	120	210	530	120	160	180	18	12	46	464 AHH
320 (315)	500÷1000	ZE500/50 S500 ZEW 500/50 S500 ZEM500/50 S500 [1]		110	250	690	160	270	605	140	190	180	18	12	65	465 AHH
400	1000÷1800	ZE 1250/60 S800 ZEW 1250/60 S800 ZEM 1250/60 S800 [1]		140	300	790	200	315	700	170	220	210	18	20	105	466 AHH
500	1700÷3200	ZE 1500/60 S1250 ZEW 1500/60 S1250 ZEM 1500/60 S1250 [1]		180	360	850	250	407	840	200	270	210	22	20	148	467 AHH
	2300÷5100	ZE 2500/60 S2000 ZEW 2500/60 S2000 ZEM 2500/60 S2000 [1]										254			162	
630	3100÷6300	ZE 2500/60 S2000 ZEW 2500/60 S2000 ZEM 2500/60 S2000 [1]		225	450	1035	325	465	925	230	300	254	22	30	238	468 AHH
710	3500÷6800	ZE 3200/80 S2500 ZEW 3200/80 S2500 ZEM 3200/80 S2500 [1]		255	500	1280	370	500	1000	260	320	254	23	30	352	469 AHH
800	3500÷8500	EB 3200/100 C250		280	560	1350	400	580	1075	280	360	254	33	35	425	470 AHH

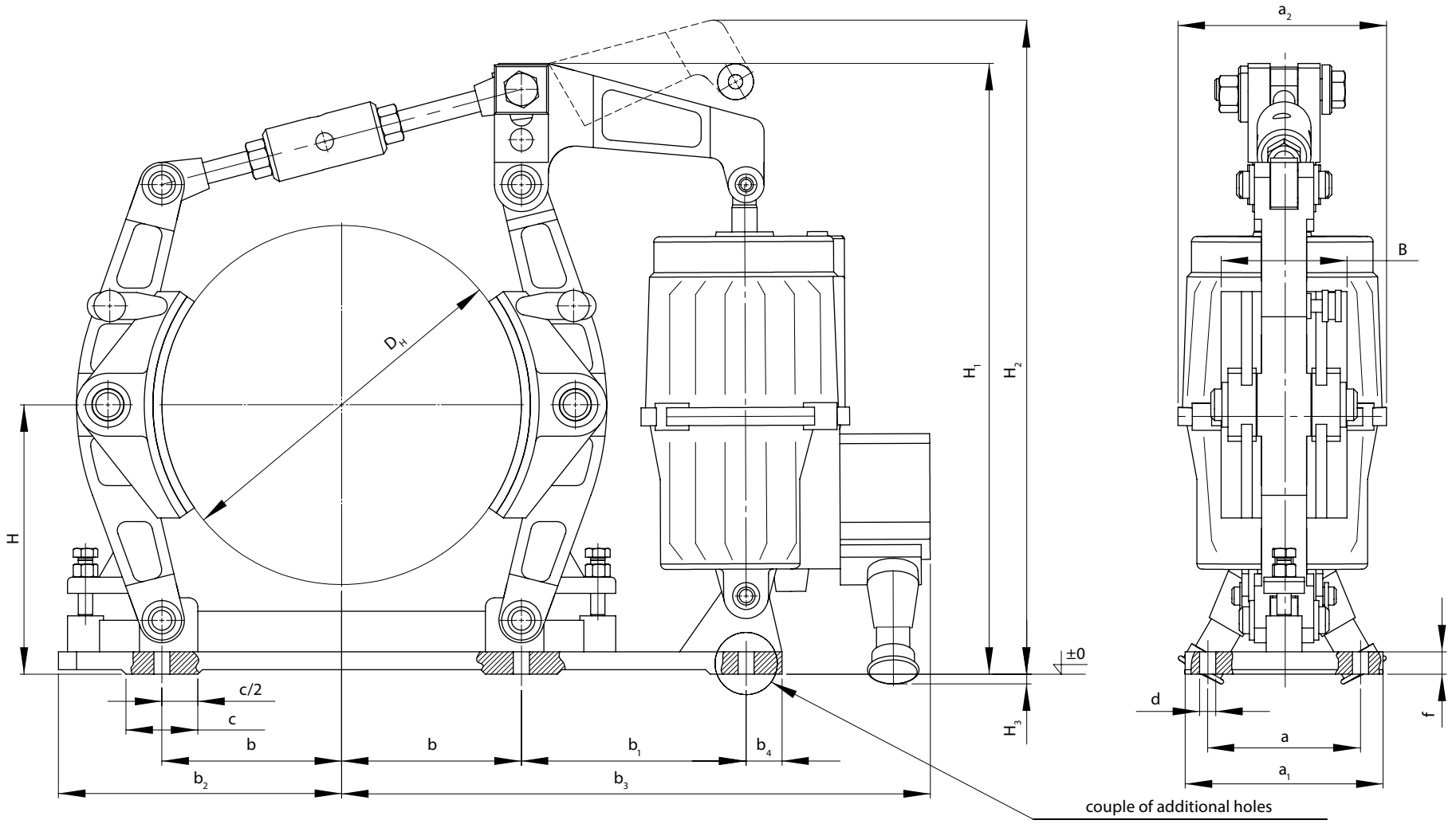
We are also offering tailor-made special versions.

[1] When utilising the ZEM... type thrustor it is necessary to provide electromagnet supply (38 V DC, current intensity of 0,4 A, for ZEM 500, 0,45 A for ZEM 800 and ZEM 1500; 0,8 A for thrustor ZEM 2500 and ZEM 3200).

[2] Thrustors with different voltage rating and frequency can be made after consultation.

[3] Brake weight with oil thrustor.

Example of designation of the AHG brake with the drum diameter of D_H=250 with the ExZE 800/60 r1 S450.500 V AC/50 Hz explosion-proof electrohydraulic thrustor (thrustor with opening contact and bimetallic switch), size of 264 *(marking see page B1-3)*:
250-ExZE 800/60 r1 S450.500 V AC/50 Hz-264 AHG Mining brake



TECHNICAL CHARACTERISTICS

Brake drum diameter D_H [1]	Braking torque M_H	Thrustor type [2]	Thrustor supply 50 Hz	Brake weight with thrustor [4]	Brake size and type
mm	Nm	–	V	kg	–
200	170÷360	ExZE 800/60... S450 ExZEM 1250/60... S450 [3]	3×230 3×400 3×500 3×660 [5] 3×1000 [5]	81	263 AHG
250	210÷400	ExZE 800/60... S450 ExZEM 1250/60... S450 [3]		95	264 AHG
320	320÷600	ExZE 800/60... S450 ExZEM 1250/60... S450 [3]		107	265 AHG
400	580÷1160	ExZE 1250/60... S800 ExZEM 1250/60... S800 [3]		135	266 AHG
500	640÷960	ExZEM 1250/60... S800 [3]		198	267 AHG
	1000÷1500	ExZE 1500/60... S1250			
	1600÷2500	ExZE 2500/60... S2000		205	
630	2300÷4000	ExZE 2500/60... S2000		292	268 AHG
710	3100÷5000	ExZE 2500/60... S2000		390	269 AHG
800	4800÷7000	ExZE 3200/80... S2500		473	270 AHG

We are also offering tailor-made special versions.

[1] On request we can produce the brake of other diameter of the brake drum.

[2] Dotted place for connector type designation and thermal protection type (see thrustor description).

[3] With the use of thrustor of ExZEM type – it is necessary to provide the supply of the electromagnet 42 VAC.

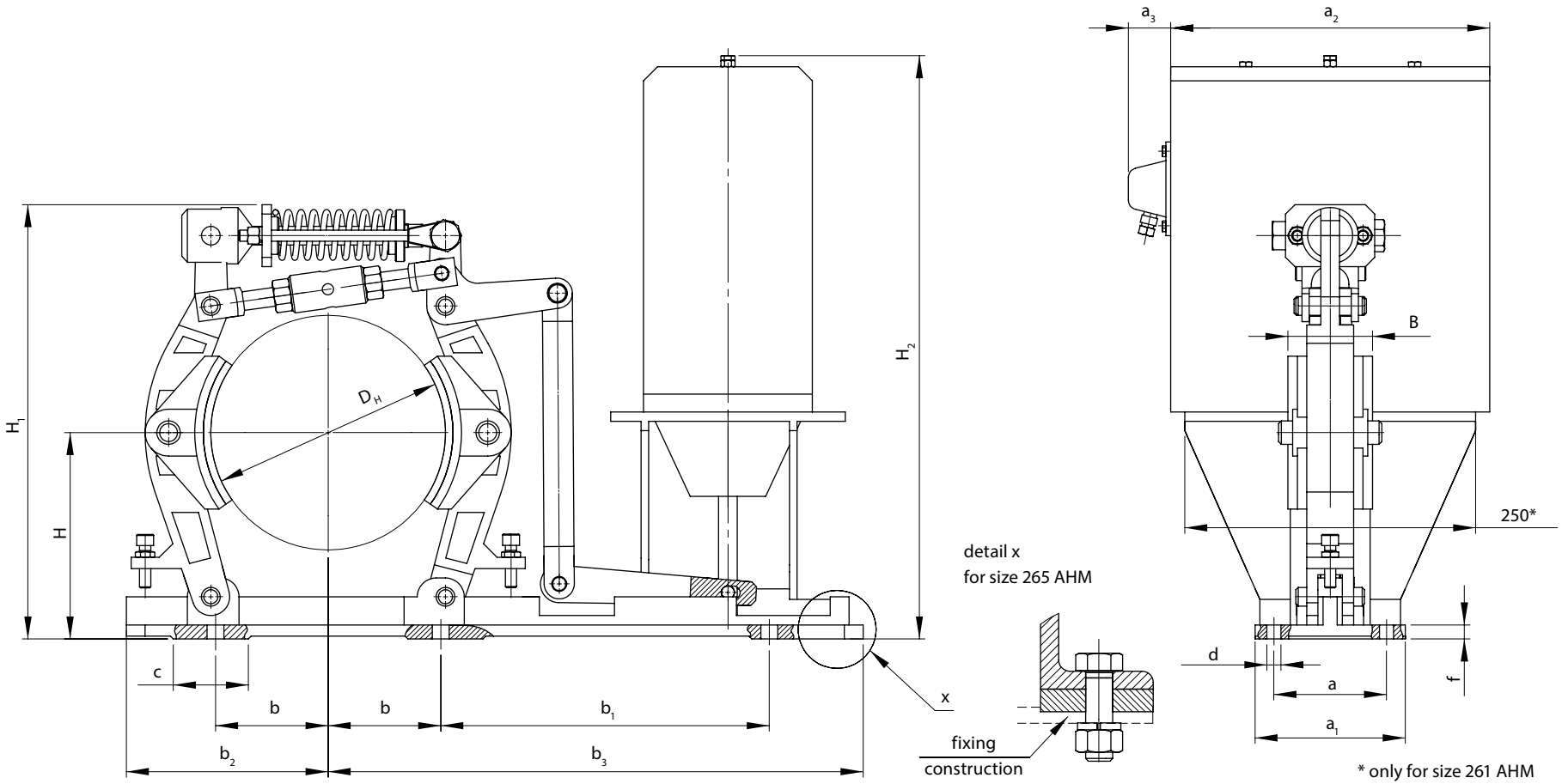
[4] Brake weight with oil thrustor.

[5] Does not apply for thrustor of ExZEM type

DIMENSIONS

Brake shoe width B	H	H_1	H_2	H_3	b	b_1	b_2	b_3	b_4	a	a_1	a_2	c	d	f	Brake size and type
mm																–
70	180	518	578	-32	95	140	190	530	75	90	130	232	60	18	15	263 AHG
90	220	528	588	-22	120	170	215	550	55	120	160	232	80	18	15	264 AHG
110	250	585	645	-17	160	220	280	615	40	140	190	232	80	18	20	265 AHG
140	300	680	685	15	200	250	315	655	40	170	220	232	80	18	25	266 AHG
180	360	820	825	37	250	280	380	750	50	200	270	270	80	22	25	267 AHG
225	450	1025	≤ H1	126	325	280	475	825	50	230	300	270	100	22	30	268 AHG
255	500	1210	≤ H1	177	370	365	500	954	50	260	320	270	100	23	30	269 AHG
280	560	1275	≤ H1	206	400	400	580	1019	60	280	360	270	120	33	40	270 AHG

Example of designation of the AHM brake with the drum diameter of D_H=200, with DZEMz 10-S3-500V/50Hz electromagnetic thrustor, size of 263 AHM *(marking see page B1-3, B1-4)*:
200-DZEMz 10-S3-500 V AC/50 Hz-263 AHM Drum brake



TECHNICAL CHARACTERISTICS

Brake drum diameter D_H	Braking torque M_H	Thrustor type	Thrustor supply [1] 50 Hz	Brake weight with thrustor	Brake size and type
mm	Nm	–	V	kg	–
120	20÷30	DZEMz 0	3×230 3×400 3×500	24,5	261 AHM
160	63÷100	DZEMz 10		39	262 AHM
200	125÷140	DZEMz 10		52	263 AHM
250	220÷320	DZEMz 30		97	264 AHM
320	400÷600	DZEMz 30		117	265 AHM

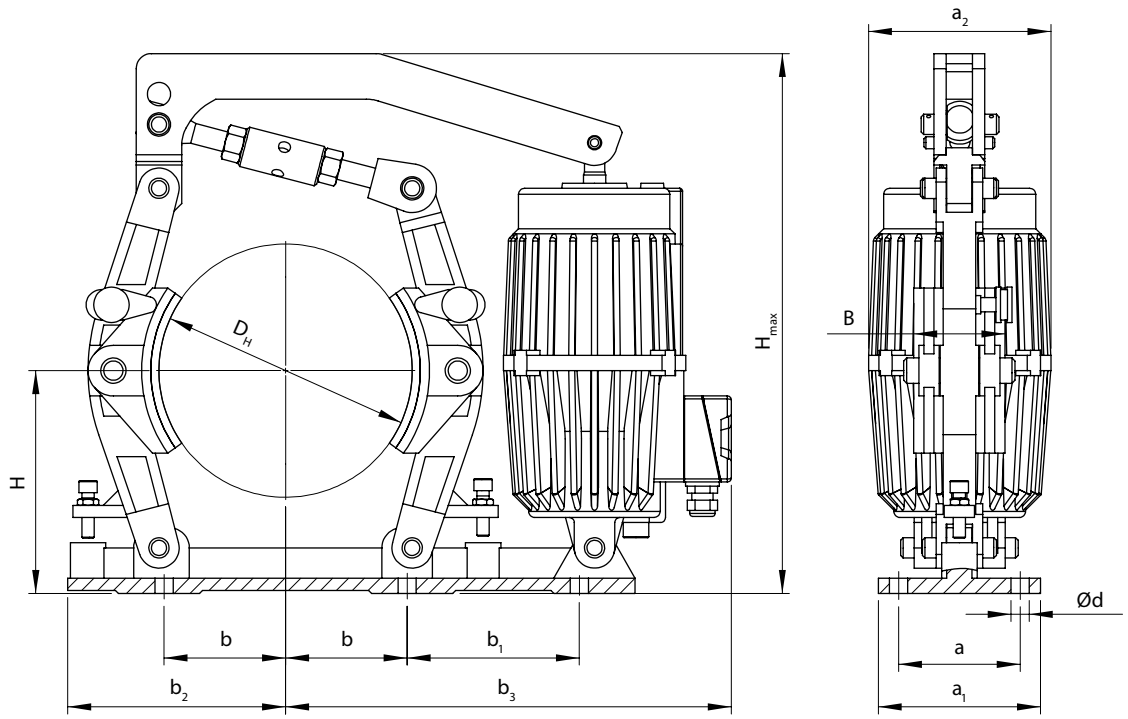
We are also offering tailor-made special versions.

[1] Thrustor with different voltage rating and frequency can be made after consultation.

DIMENSIONS

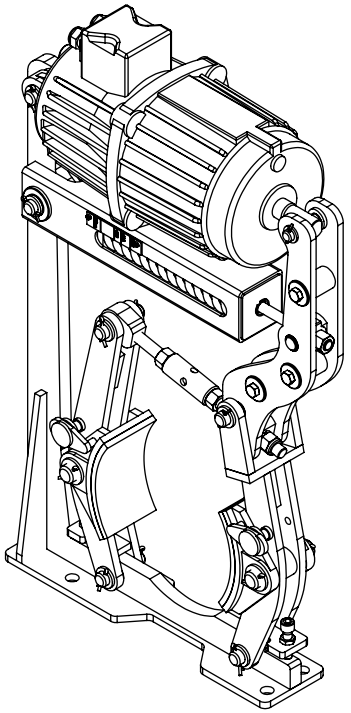
Brake shoe width B	H	H_1	H_2	b	b_1	b_2	b_3	a	a_1	a_2	a_3	c	d	f	Brake size and type
mm															–
40	110	250	300	55	290	155	375	105	145	197	60	50	13	13	261 AHM
50	130	320	411	80	297	160	407	110	150	250	50	50	13	10	262 AHM
70	180	385	411	95	328	205	465	90	130	250	50	60	18	16	263 AHM
90	220	463	652	120	350	260	530	120	160	340	50	80	18	18	264 AHM
110	250	585	650	160	528	270	730	140	180	340	50	80	18	20	265 AHM

Example of designation of the AHT brake with the drum diameter of D_H=250, with ZE 500/50 S 180.400V/50Hz electrohydraulic thrustor, size of 264 AHT *(marking see page B1-3)*:
250-ZE 500/50 S180 400 V AC/50 Hz-264 AHT Holding drum brake

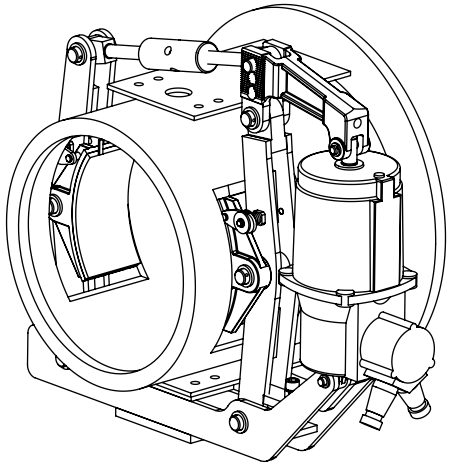


Brake drum diameter D_H	Braking torque M_H	Thrustor type	Thrustor supply 50 Hz	Brake shoe width B	H	H_{max}	b	b_1	b_2	b_3	a	a_1	a_2	d	Brake weight with thrustor	Brake size and type
mm	Nm	–	V	mm											kg	–
250	270÷400	ZE 500/50 S180 ZEW 500/50 S180	3×230 3×400 3×500	90	220	565	120	170	215	440	120	160	180	18	47	264 AHT
420	1060÷1400	ExZE 1250/60 S450 ZE 1250/60 S450 ZEW 1250/60 S450		110	260	670	100	280	315	665	90	160	232	18	122	266 AHT
500	400÷600	ZE 1500/60 S1250 ZEW 1500/60 S1250		180	360	940	250	280	380	675	200	270	210	22	165	267 AHT
	1400÷2450	ZE 1500/60 S450 ZEW 1500/60 S450														

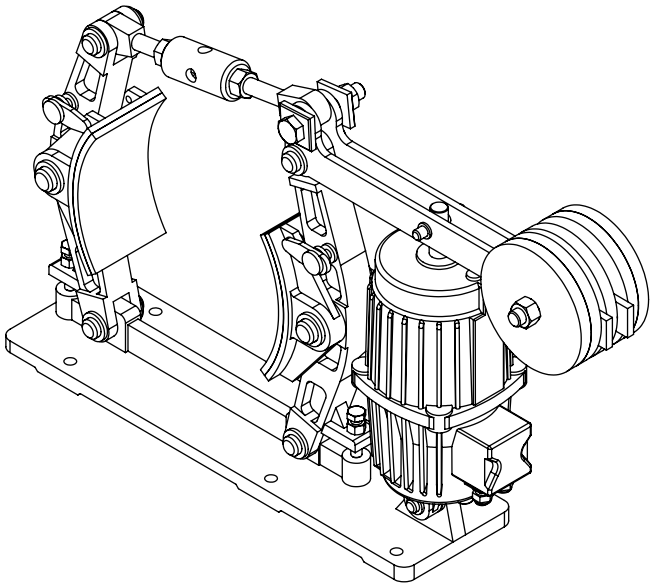
On request we produce special types of brakes taking into account the individual needs and requirements of the customer. The special constructions can have different dimensions in relation to the catalogue dimensions and they can also constitute a new construction adjusted to the needs and the construction of the machine to which the brake is going to be inbuilt. Below several solutions are presented.



AHH-P drum brake
With the thrustor in horizontal arrangement



AHG-G mining brake
Adapter for instalation on a flange connector.



AHC load brake
The braking torque is generated by the weight attached to the brake lever and is independent of the degree of lining wear (within the permissible working range of the friction linning thickness). The brake uses a release without a spring.