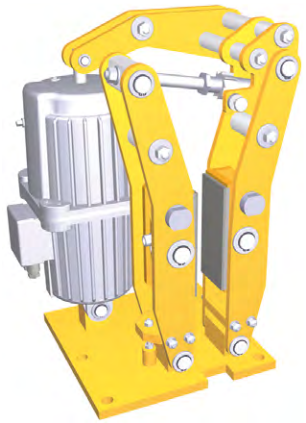
Disc brakes with the electrohydraulic thrustors of ZE type are adjusted to the cooperation with brake discs on their lateral surface. Braking torque is created by the spring inbuilt in the body of the thrustor or by the lever system (series 100), which through the compound lever causes pressing down of the brake shoes with friction linings to the friction surface of the brake disc.

Turning on the supply voltage of the thrustor starts the motor and the pump forcing the oil under the piston of the thrustor which causes that the piston moves up and the brake is released. Turning off the supply causes that the piston moves down (under the influence of the spring inbuilt in the thrustor or outside the thrustor- series 100) and the brake is applied. The speed of raising or falling of the piston can be adjusted through the use of the valve delaying the falling or lifting of the piston.

ZE thrustors can be equipped with inductive sensor of piston rod position mounted outside or with external mechanical switch signaling upper or lower position of the piston rod. Above mentioned sensors and switches require appropriate source of supply.

VARIANTS:
- **ATZ** – standard
- **ATZ (series 100)** – with outer spring
- **ATG** – mining
- **ATG (series 100)** – mining with outer sprig

WORKING CONDITIONS:
The brakes are intended for operation in moderate climate on the land. In the case of operation "in the open air" it is recommended to shield the brake to protect it against the precipitation. The brakes are intended mainly for operation in horizontal position (the basis mounted on the horizontal surface). Operation in other 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, paper-making and other industries.

MATERIAL: construction of the brake – steel; brake shoes – spheroidal iron cast; asbestos-free friction lining; ZE thrustor body – aluminium, ExZE – iron cast; bolts made of stainless steel, self-lubricating sleeves.

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
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, indi cation 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
IP 67 rating

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
The thrustor is made as an explosion-proof device in a flameproof casing with in-trinsically 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"**.

METHOD OF MARKING:

[**name**] – [**D_H**] / [**B**] – [**version**] – [**mounting**] – [**thrustor marking**] – [**size**][**type**] – [**version***]

* only when it concerns a given type, where:

name	e.g. disc brake
D_H	diameter of the disc brake [mm]
B	brake disc thickness [mm]
version	left "L", right "R"
mounting of the thrustor junction box	position "A", position "B"
thrustor marking	*see below*
size	e.g. 001
type	e.g. ATZ
version	WS… – special (individual arrangements)

METHOD OF THRUSTOR MARKING:

TYPE ZE

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

* only when it applies, where:

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. 50
spring	e.g. S 450
oil	normally transformer oil (omit the marking)
voltage	e.g. 500 V AC/50 Hz
sensor marking	(if required) – e.g: inductive B1 – "Ci-B1", mechanical "Cm"

TYPE ExZE

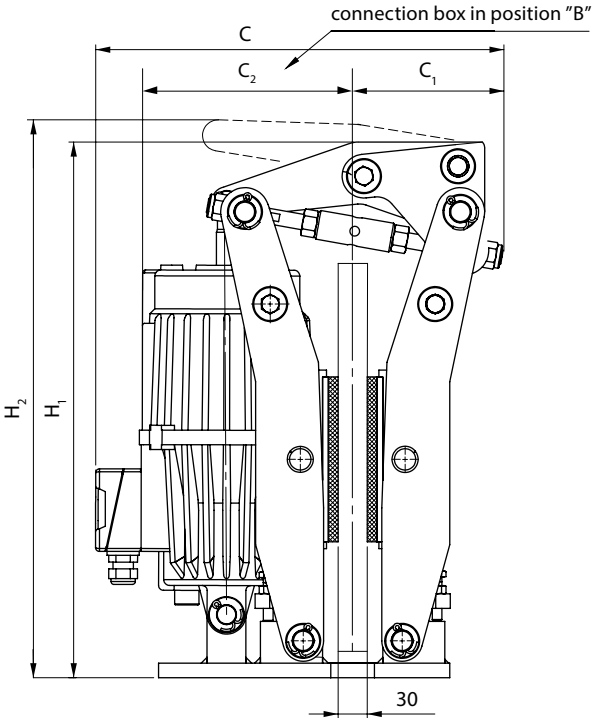
[**version**] – [**size**] / [**stroke**][**contact**][**protection**][**spring***] · [**voltage**]

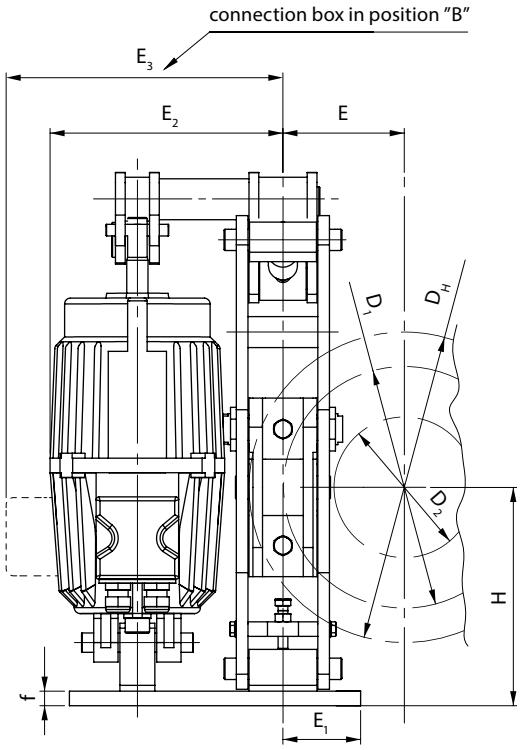
* only when it applies, where:

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

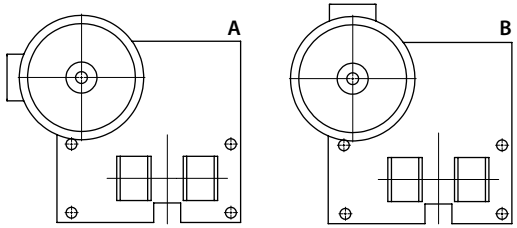
Example of designation of the ATZ brake working with the brake disc diameter of D_H=400 mm and thickness of B=30 mm, in the left version, with the terminal box in A position, with the ZE 500/50 S500. 400 V AC / 50 Hz electrohydraulic thrustor, size of 001 *(marking see page B2-2, B2-3)*:

400/30-L-A-ZE 500/50 S500.400 V AC/50 Hz-001 ATZ Disc brake

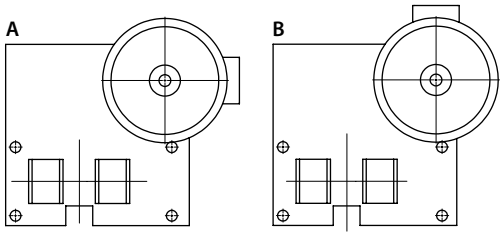


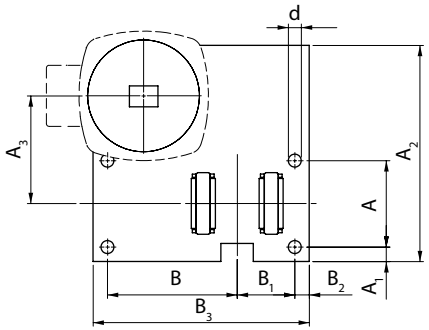


Brake in right version R
connection box in position:



Brake in left version L
connection box in position:





Brake disc diameter D_H	Theoretical braking diameter D_1	Maximum hub or coupling diameter D_2	E	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz
mm				Nm	–	V
001 ATZ DISC BRAKES						**Weight: 55 kg [3]**
320	248	145	125	200	ZE 500/50 S 180 ZEW..., ZEM... [1]	3×230 3×400 3×500
				350	ZE 500/50 S 320 ZEW..., ZEM... [1]	
				550	ZE 500/50 S 500 ZEW..., ZEM... [1]	
400	320	205	160	250	ZE 500/50 S 180 ZEW..., ZEM... [1]	
				450	ZE 500/50 S 320 ZEW..., ZEM... [1]	
				750	ZE 500/50 S 500 ZEW..., ZEM... [1]	
500	420	305	210	330	ZE 500/50 S 180 ZEW..., ZEM... [1]	
				600	ZE 500/50 S 320 ZEW..., ZEM... [1]	
				1000	ZE 500/50 S 500 ZEW..., ZEM... [1]	
002 ATZ DISC BRAKES						**Weight: 92 kg [3]**
450	350	200	175	700	ZE 800/60 S 450 ZEW..., ZEM... [1]	3×230 3×400 3×500
				1300	ZE 1250/60 S 800 ZEW..., ZEM... [1]	
				2000	ZE 1500/60 S 1250 ZEW...	
500	400	250	200	850	ZE 800/60 S 450 ZEW..., ZEM... [1]	
				1500	ZE 1250/60 S 800 ZEW..., ZEM... [1]	
				2300	ZE 1500/60 S 1250 ZEW...	
630	530	380	265	1100	ZE 800/60 S 450 ZEW..., ZEM... [1]	
				2000	ZE 1250/60 S 800 ZEW..., ZEM... [1]	
				3000	ZE 1500/60 S 1250 ZEW...	
003 ATZ DISC BRAKES						**Weight: 230 kg [3]**
630	500	320	255	8500	ZE 3200/80 S 2500 ZEW..., ZEM... [1]	3×230 3×400 3×500
710	580	400	395	10000		
800	670	490	340	11500		
1000	990	690	435	15000		

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.

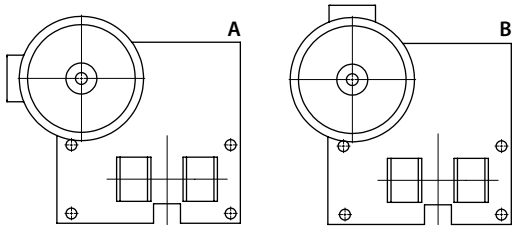
[4] After agreement the dimension can be changed.

DIMENSIONS

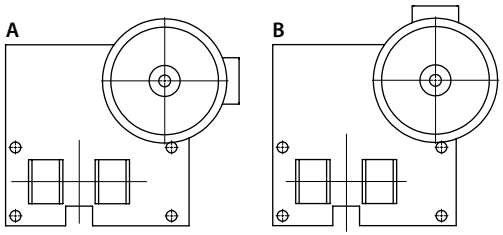
H [4]	H_1	H_2	A	A_1	A_2	A_3	B	B_1	B_2	B_3	C	C_1	C_1	E_1	E_2	E_3	f	d	Brake size and type
mm																			–
225	540	570	120	20	300	150	180	80	20	300	420	155	220	80	240	285	15	18	001 ATZ
280	685	715	140	20	370	215	130	130	20	375	520	200	280	90	320	358	15	22	002 ATZ
300	980	1050	160	30	410	235	180	180	50	460	635	295	314	110	365	387	20	27	003 ATZ

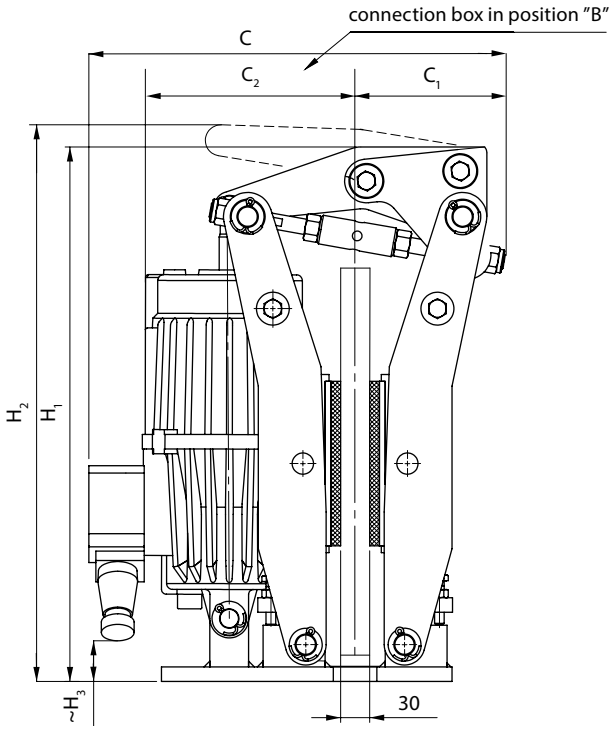
Example of designation of the ATG brake working with the brake disc diameter of D_H=400 mm and thickness of B=30 mm, in the right version, with the terminal box in A position, with the ExZE 800/60 r1 S450. 500V AC / 50 Hz electrohydraulic thrustor (with opening contact and bimetallic switch), size of 001 ATG *(marking see page B2-2, B2-3)*:
400/30-R-A-Ex ZE 800/60 r1 S450.500 V AC/50 Hz-001 ATG Disc mining brake

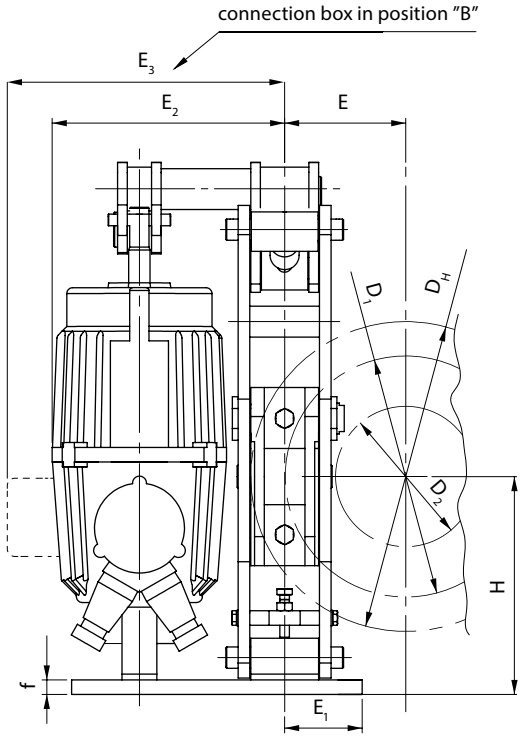
Brake in right version R
connection box in position:

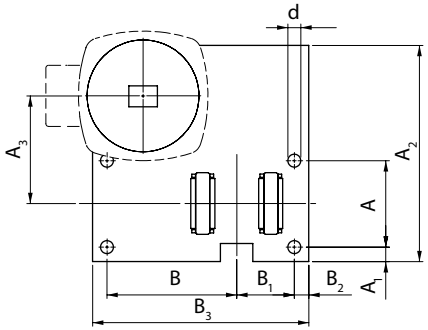


Brake in left version L
connection box in position:









Brake disc diameter D_H	Theoretical braking diameter D_1	Maximum hub or coupling diameter D_2	E	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz
mm				Nm	–	V
001 ATG DISC MINING BRAKES						**Weight: 96 kg [3]**
320	248	145	125	500	ExZE 800/60 ...S 450 ExZEM 1250/60 ...S 450 [1]	3×230 3×400 3×500 3×690 [4] 3×1000 [4]
400	320	205	160	650		
500	420	305	210	850		
002 ATG DISC MINING BRAKES						**Weight: 122 kg [3]**
450	350	200	175	700	ExZE 800/60 ...S 450 ExZEM 1250/60 ...S 450 [1]	3×230 3×400 3×500 3×690 [4] 3×1000 [4]
				1300	ExZE 1250/60 ...S 800 ExZEM 1250/60 ...S 800 [1]	
				2000	ExZE 1500/60 ...S 1250	
500	400	250	200	850	ExZE 800/60 ...S 450 ExZEM 1250/60 ...S 450 [1]	
				1500	ExZE 1250/60 ...S 800 ExZEM 1250/60 ...S 800 [1]	
				2300	ExZE 1500/60 ...S 1250	
630	530	380	265	1100	ExZE 800/60 ...S 450 ExZEM 1250/60 ...S 450 [1]	
				2000	ExZE 1250/60 ...S 800 ExZEM 1250/60 ...S 800 [1]	
				3000	ExZE 1500/60 ...S 1250	
003 ATG DISC MINING BRAKES						**Weight: 274 kg [3]**
630	510	320	255	8500	ExZE 3200/80... S2500	3×230 3×400 3×500 3×690 3×1000
710	590	400	295	10 000		
800	680	490	340	11 500		
1000	870	690	435	15 000		

We are also offering tailor-made special versions.

[1] When using ZEM... type thrustors, it is necessary to provide electromagnet supply 42 V AC.

[2] Thrustors for other voltage rating and frequency can be made after consultation.

[3] Brake weight with oil thrustor.

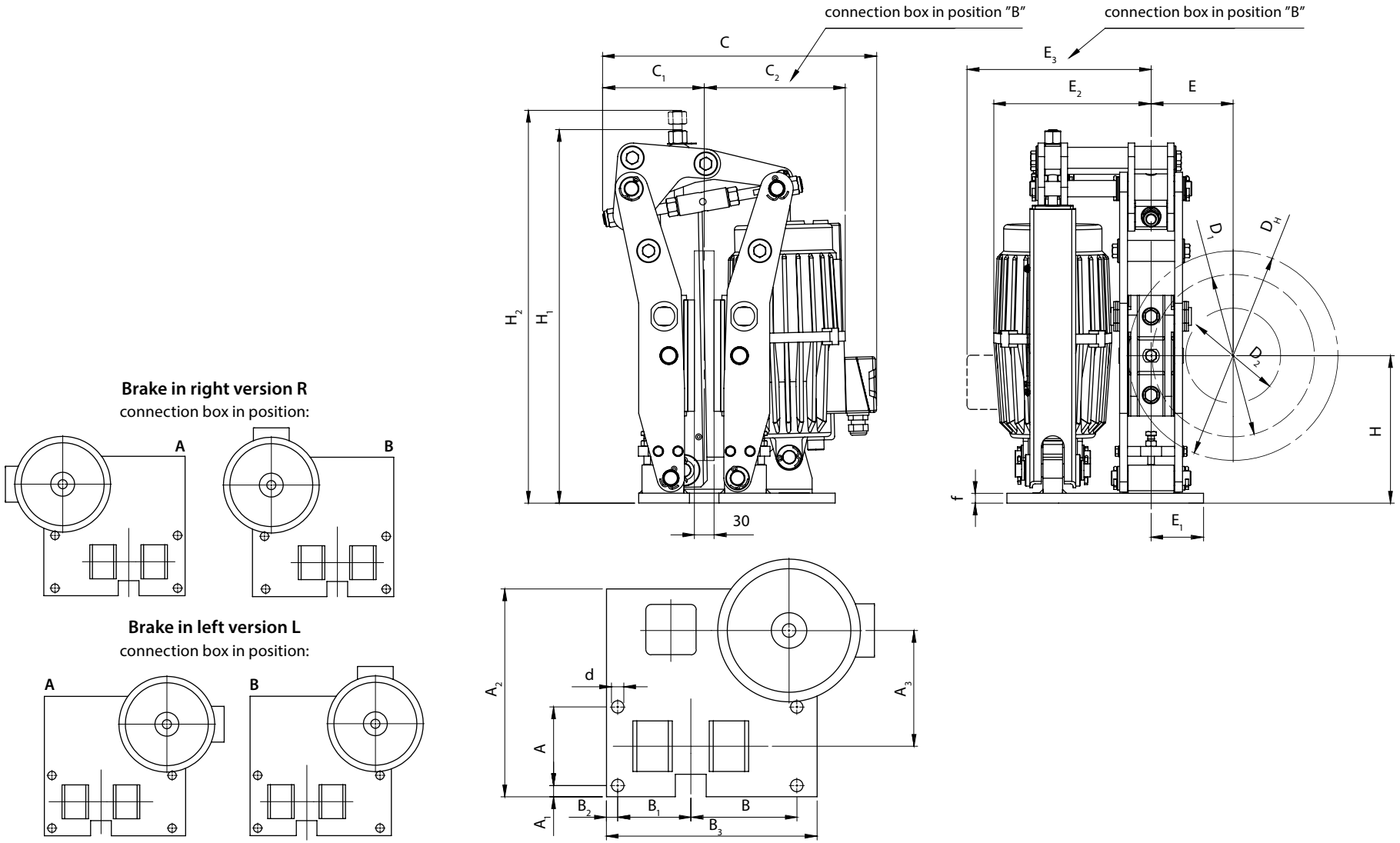
[4] Does not apply for thrustors of ExZEM type.

[5] After agreement the dimension can be changed.

DIMENSIONS

H [5]	H_1	H_2	H_3	A	A_1	A_2	A_3	B	B_1	B_2	B_3	C	C_1	C_2	E_1	E_2	E_3	f	d	Brake size and type
mm																				–
225	580	620	–10	120	20	300	175	180	80	20	300	490	155	246	80	291	381	15	18	001 ATG
280	685	715	50	140	20	370	215	130	130	20	375	580	200	291	90	331	421	15	22	002 ATG
300	980	1050	180	160	30	410	250	180	180	50	460	705	295	322	110	385	470	20	27	003 ATG

Example of designation of the ATZ brake (series 100) working with the brake disc diameter of D_H=400 mm and thickness of B=30 mm, in the left version, with the terminal box in A position, with the ZE 500/50 400V AC / 50 Hz electrohydraulic thrustor, size of 101 ATG *(marking see page B2-2, B2-3)*:
400/30-L-A-ZE 500/50.400V AC/50Hz-101 ATZ Disc brake



Brake disc diameter D_H	Theoretical braking diameter D_1	Maximum hub or coupling diameter D_2	E	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz
mm				Nm	–	V
101 ATZ DISC BRAKES						**Weight: 64 kg [3]**
320	248	145	125	150÷550	ZE 500/50 ZEW 500/50 ZEM 500/50 [1]	3×230 3×400 3×500
400	320	205	160	190÷750		
500	420	305	210	250÷1000		
102 ATZ DISC BRAKES						**Weight: 114 kg [3]**
450	350	200	175	520÷2000	ZE 1500/60 ZEW 1500/60 ZEM 1500/60 [1]	3×230 3×400 3×500
500	400	250	200	600÷2300		
630	530	380	265	790÷3000		
102 ATZ-2 DISC BRAKES						**Weight: 147 kg [3]**
630	530	380	265	1500÷4300	ZE 2000/120 ZEW 2000/120 ZEM 2000/120 [1]	3×230 3×400 3×500
800	700	530	350	2000÷5500		
1120	1020	850	510	3000÷8300		
103 ATZ DISC BRAKES						**Weight: 260 kg [3]**
800	670	490	340	3800÷11500	ZE 3200/80 ZEW 3200/80 ZEM 3200/80 [1]	3×230 3×400 3×500
1000	870	690	435	5000÷15000		
1120	990	810	495	5600÷17000		

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.

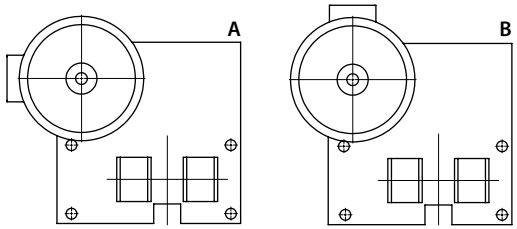
[4] After agreement the dimension can be change.

DIMENSIONS

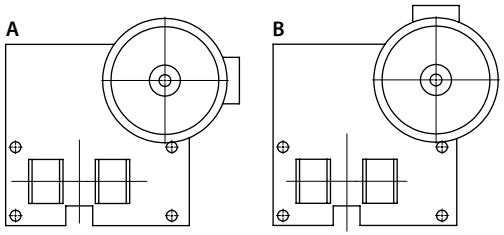
H [4]	H_1	H_2	A	A_1	A_2	A_3	B	B_1	B_2	B_3	C	C_1	C_1	E_1	E_2	E_3	f	d	Brake size and type
mm																			–
225	570	585	120	20	300	150	180	80	20	300	420	155	220	80	240	285	15	18	101 ATZ
280	725	735	140	20	370	215	130	130	20	375	520	200	280	90	320	358	15	22	102 ATZ
280	735	800	140	20	370	215	130	130	20	375	520	200	280	90	320	358	15	22	102 ATZ-2
300	1010	1080	160	30	410	235	180	180	50	460	635	295	314	110	365	387	20	27	103 ATZ

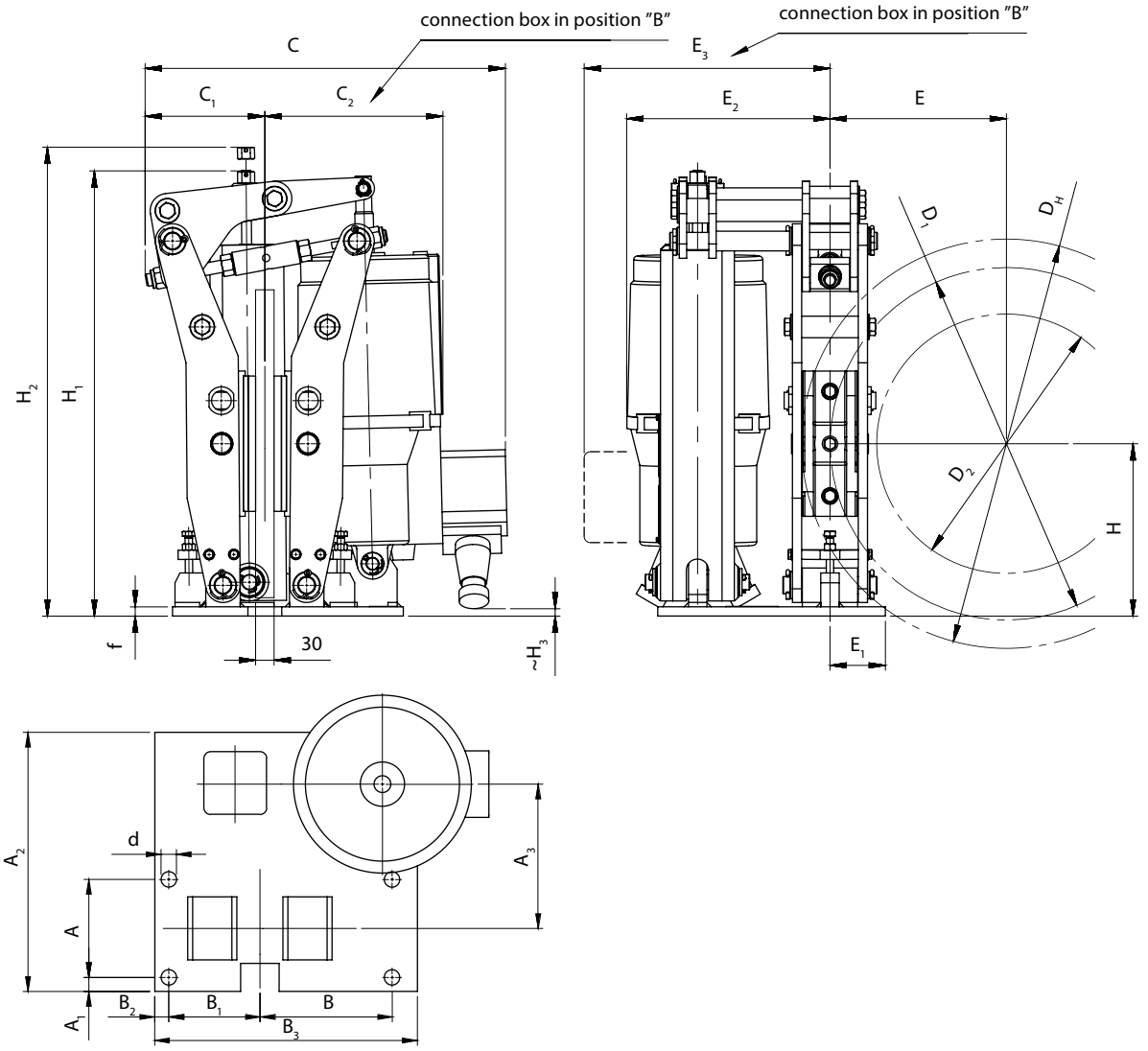
Example of designation of the ATG brake (series 100) working with the brake disc diameter of D_H=400 mm and thickness of B=30 mm, in the left version, with the terminal box in A position, with the ExZE 800/60 r1. 400V AC / 50 Hz electrohydraulic thrustor (with opening contact and bimetallic switch), size of 101 ATG *(marking see page B2-2, B2-3)*:
400/30-L-A-ExZE 800/60 r1.400V AC/50Hz-101 ATG Disc mining brake

Brake in right version R
connection box in position:



Brake in left version L
connection box in position:





Brake disc diameter D_H	Theoretical braking diameter D_1	Maximum hub or coupling diameter D_2	E	Braking torque M_H	Thrustor type	Thrustor supply [2] 50 Hz
mm				Nm	–	V
101 ATG DISC MINING BRAKES						**Weight: 105 kg [3]**
320	248	145	125	200÷800	ExZE 800/60	3×230 3×400 3×500 3×690 3×1000
400	320	205	160	250÷1000		
500	420	305	210	300÷1300		
102 ATG DISC MINING BRAKES						**Weight: 146 kg [3]**
450	350	200	175	520÷1700	ExZEM 1250/60 [1]	3×230 3×400 3×500 3×690 [4] 3×1000 [4]
500	400	250	200	600÷2000		
630	530	380	265	790÷2600		
450	350	200	175	520÷2000	ExZE 1500/60	
500	400	250	200	600÷2300		
630	530	380	265	790÷3000		
103 ATG DISC MINING BRAKES						**Weight: 304 kg [3]**
800	670	490	340	3800÷11500	ExZE 3200/80	3×230 3×400 3×500 3×690 3×1000
1000	870	690	435	5000÷15000		
1120	990	810	495	5600÷17000		

We are also offering tailor-made special versions.

[1] When using ZEM... type thrustors, it is necessary to provide electromagnet supply 42 V AC.

[2] Thrustors for other voltage rating and frequency can be made after consultation.

[3] Brake weight with oil thrustor.

[4] Does not apply for thrustors of ExZEM type.

[5] After agreement the dimension can be changed.

DIMENSIONS

H [5]	H_1	H_2	H_3	A	A_1	A_2	A_3	B	B_1	B_2	B_3	C	C_1	C_2	E_1	E_2	E_3	f	d	Brake size and type
mm																				–
225	610	655	–10	120	20	300	175	180	80	20	300	516	155	271	80	291	381	15	18	101 ATG
280	725	735	50	140	20	370	215	130	130	20	375	580	200	291	90	331	421	15	22	102 ATG
300	1010	1080	180	160	30	410	250	180	180	50	460	705	295	322	110	385	470	20	27	103 ATG