KAKKU MILL DUTY DC ELECTRO-MAGNETIC BRAKES
SERIES KBD

SPECIAL FEATURES

- Conforms to Russian Standards, exactly replacing the brakes of TKП series of USSR.
- Well proven performance and hence reliability is ensured.
- Provided with class 'F' insulated epoxy encapsulated coil ensuring longer life and suitability to work efficiently in hazardous environment.
- Ease of adjustment of torque quickly by just turning the adjustment nut.
- Accurate manufacturing and strict adherence to engineering standards for longer working life.
- Also available for floor and ceiling mounting and with accessories like limit switch.
- Convenient manual release possible in every brake by just turning the manual release nut.
- All the parts are easily accessible and hence ensures quick maintenance.
- Quick adjustment of both the shoes together by just one adjustment bolt to maintain uniform shoe gap.

SALIENT FEATURES

SIMPLICITY

KAKKU Brakes Series KBD are robust in construction and simple in design having minimum number of parts and thus reducing maintenance problems and down time.

RELIABLE BRAKING ACTION

The design of KAKKU brakes ensure efficient transmission of braking force. Also the braking action is spread evenly over both the shoes providing maximum stopping power with minimum wear of shoe lining. Because of the large bearing area and close tolerances, minimum wear of supporting pins is ensured.

MAGNET SYSTEM & COIL

KAKKU brakes are provided with powerful short stroke Electro-magnets. The Electro-magnetic gap can be conveniently adjusted by holding the end lock nut and turning the tail end of the tie rod. The magnet is effectively protected against ingress of dust. KAKKU brakes are provided with epoxy encapsulated coil with class 'F insulation. The design of the brakes ensures convenient replacement of coil. The coil are liberally designed for high ambient.

LINING

Shoe linings are made from asbestos based woven material, which has a high co-efficient of friction and low rate of wear. The linings are normally riveted to the shoe.

SHOE ADJUSTMENT

Uniform receding of both the shoes can be adjusted by just turning one shoe adjuster bolt, provided on the lever arm under the magnet assembly. This adjustment can be locked with the help of a check nut.

SHOE POSITIONING

The brakes are provided with shoe positioners under the brake shoe to rigidly secure the brake shoes & prevent them from tilting and riding the drum when brakes are released.

TORQUE SETTING

The U-shaped clamp within which the torque spring is assembled is marked with various torque positions of the spring .The torque can be adjusted by compressing the torque spring up to the desired marking. This adjustment can also be locked with the help of a check nut. Once set, the braking torque does not require any major adjustment for a long time.

FAIL SAFE DESIGN

KAKKU DC Electro-magnetic brakes series KBD are electrically released and spring set. When the coil is energised the armature is attracted to compress the torque spring and move the shoes away from the drum thus releasing the brake. De-energising the coil allows the torque spring to separate the armature and press the shoes against the drum, thus setting brake. This makes the brake fail safe in the event of power failure.

SIZES

Available in size 100, 150, 160, 200, 250, 300, 315, 400, 500, 600, 630, 700 & 800 mm dia of drum.

TYPES

KAKKU brakes Series KBD are basically of two types i.e. Shunt Brakes & Series brakes. In shunt wound brakes, braking action is independent of motor whereas in series wound brakes it depends on the current drawn by DC motor.

SHUNT BRAKES

Shunt Brakes have their coils separately energized from a DC source or AC source when used with rectifier panel. These brakes are rated for different cycle of duty factor when used directly with DC supply. When these brakes are used with rectifier panel for AC operation, the torque rated for 25% CDF (i.e. maximum torque) can be obtained even if the brakes are used for continuous duty. This advantage is achieved because of the forcing circuit in the rectifier panel.

SERIES BRAKE

Series Brakes have their coils in the armature circuit of DC motors. These brakes are available for 15% 25% & 40% CDF.

DIMENSIONS

As per relevant figures shown in the dimensional data sheet.

TECHNICAL DATA

Torque Characteristics	:	See Table I & II.
Class of insulation of coil	:	Class 'F'.
Insulation Voltage	:	660V.
Brake release voltage (magnet pick-up) for shunt coils	:	80 % of rated voltage.
Brake release current for series coils	:	60% or 40% of the rated current as per details given on the table II for current and torque ratings.
Brake set voltage for shunt coil .	:	Below 50% of the rated voltage.
Brake set current for series coil	:	Below 10% of the rated current.
No. of operations per hour	:	720 (This is limited by the time required for brake to operate).
Mechanical life	:	20×10^6 operations.

Table –I Torque characteristics for Shunt Brakes.

Brake Type	Drum Dia (mm)	Torque Rating (Kg. Cm.)				Magnet Stroke (mm)		~erst-while USSR Type
		D.C Operation *			AC ** Operation			
		25%CDF	40%CDF	Cont. duty	Cont. duty	Normal	Max.	
KBD-100/100	100	200	160	70	200	1.2	2	ТКП-100/100
KBD-150/150	150	650	450	330	650	2.0	3	
KBD-160/150	160	760	570	330	760	2.0	3.0	
KBD-150/200	150	1000	850	450	1000	2.0	3	
KBD-160/200	160	1100	900	500	1100	2.0	3	
KBD-200/100	200	400	320	130	400	1.2	2	ТКП-200/100
KBD-200/200	200	1600	1250	650	1600	2.0	3	ТКП-200/200
KBD-250/200	250	2800	2000	1400	2800	2.0	3	
KBD-250/300	250	4170	3500	1700	4170	2.5	3.5	
KBD-300/200	300	2800	1900	1400	2800	2.0	3.0	ТКП-300/200
KBD-300/300	300	7600	4200	1700	7500	2.5	3.5	ТКП-300/300
KBD-315/300	315	7500	4200	1700	7500	2.5	3.5	
KBD-400	400	15000	11000	5500	15000	2.0	3.0	ТКП-400
KBD-500	500	25000	18000	9500	25000	2.5	3.5	ТКП-500
KBD-600	600	50000	36000	19000	50000	2.7	4.0	ТКП-600
KBD-630	630	50000	36000	19000	50000	2.7	4.0	
KBD-700	700	80000	60000	25000	80000	3.0	4.0	ТКП-700
KBD-800	800	125000	90000	32000	125000	3.5	4.5	ТКП-800

* Without forcing circuit.
** With forcing circuit

NOTE: Torque/ Dimensional detail for brakes suitable for Drum dia 450mm can be furnished against specific request.

TABLE –II Current And Torque Ratings For Series Brakes

Series Brake Type	Drum dia (mm)	Current Ratings: Rated Coil current I (Nominal) 15% CDF	25% CDF	40% CDF	Braking Torque in Kg. Cm: At 60% of I (Nominal)* 25% CDF	40% CDF	At 40% of I (Nominal)** 25% CDF	40% CDF	~erst-while USSR Type
KBD-400	400	96.5	75	59	15000	11000	10000	7000	TKП-400
		139	108	85.5					
		192	149	118					
		231	179	141					
		268	208	164					
		345	268	212					
KBD-500	500	201	156	123	25000	18000	16500	12000	TKП-500
		316	245	193					
		495	383	302					
KBD-600	600	209	162	128	50000	36000	33000	24000	TKП-600
		300	233	184					
		510	395	312					
		630	490	387					
KBD-700	700	302	234	185	80000	60000	54000	40000	TKП-700
		715	555	438					
		1175	910	720					
KBD-800	800	595	480	363	125000	90000	75000	55000	TKП-800
		1355	1050	830					

* for moving mechanisms
** for hoisting mechanisms.

- Torque data of Series Brakes up to 315mm dia of Drum can be furnished on request.
- If the motor current is lesser than the rated current of electro-magnetic coil, the torque given in the above table is reduced approximately in proportion to the current drop.

SELECTION OF BRAKE SIZE

- For most applications, the brake torque must be equal to or greater than motor full load torque as referred to the drum/wheel shaft.
- Thus, Torque in Kg. m = $\frac{974 \times KW}{rpm}$

  Where
  KW = motor output
  rpm = revolution per minute

With torque requirements known and the type and the duty cycle established, the brake is selected accordingly from the selection table. For certain special applications e.g. crane hoist and other overhauling loads the brake should be capable of providing at least 150% of motor torque.

OPTIONAL EXTRAS

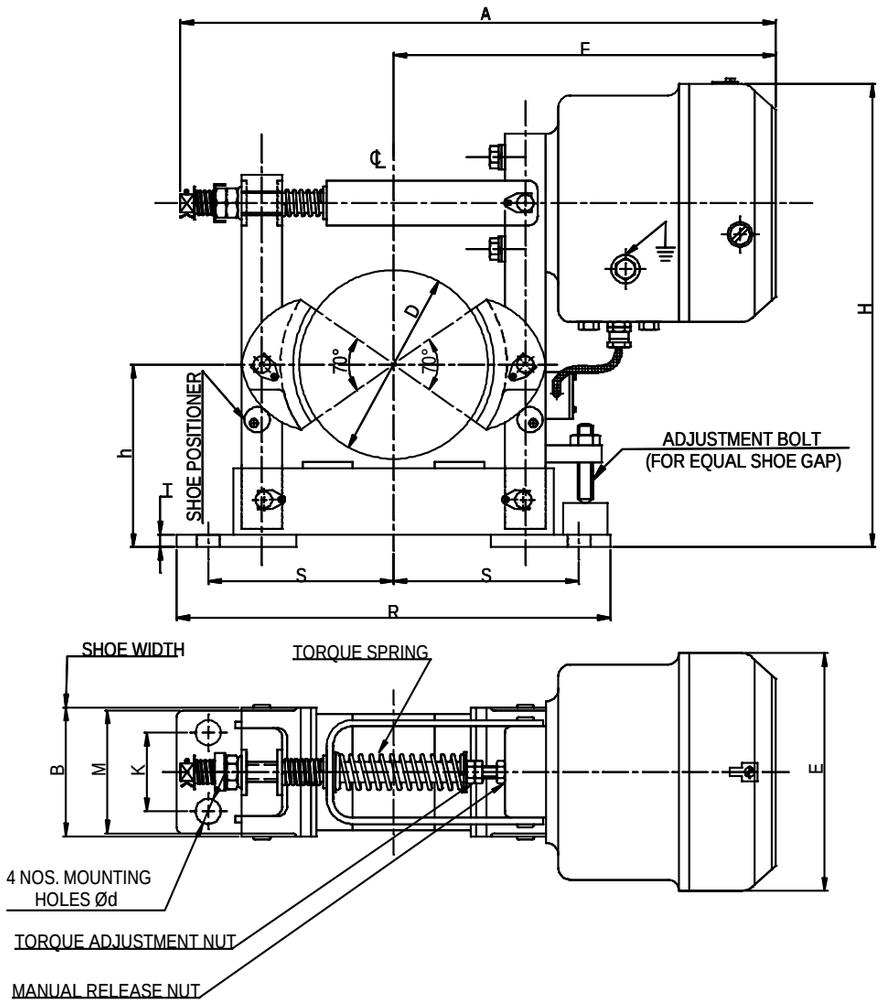
Special epoxy paint to withstand corrosive atmosphere.

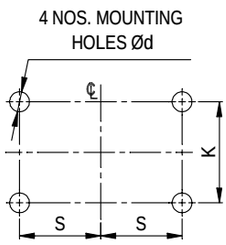
- Limit switch attachment to indicate brake release or setting.
- Shoe bolted linings.
- Dust proof terminal box for coils leads in case of shunt brakes.
- Higher shoe width.

ORDERING INFORMATION

- Give KAKKU type No.
- If shunt brake is energised from DC source without forcing circuit, the supply voltage and duty cycle in % CDF.
- If shunt brake is energized from AC source, its supply voltage and control voltage, for use with the rectifier panel.
- For series brake, the nominal current rating, CDF and torque requirement.
- Specify optional extras if any.

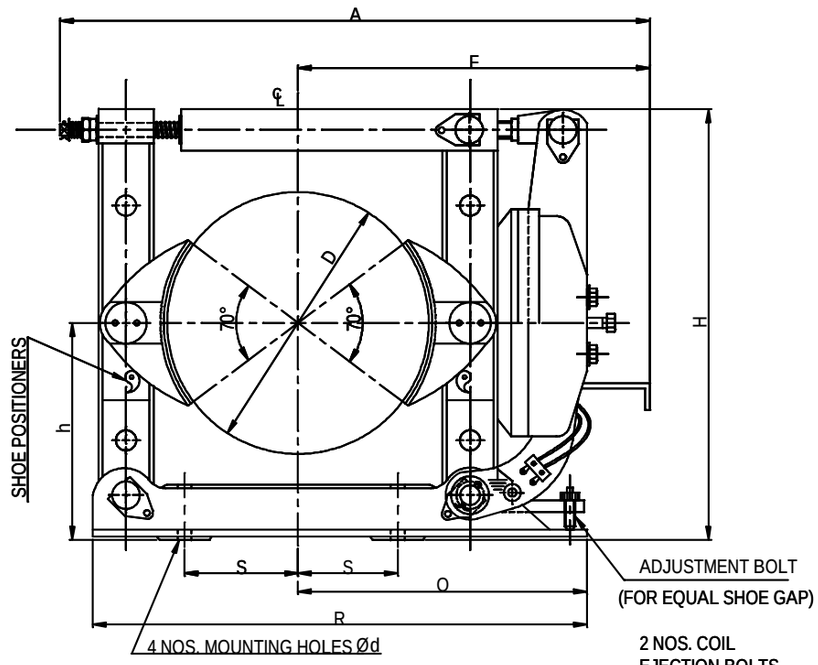
Product improvement is a continuous process at KAKKU. Hence data given in this catalogue is subject to revision without notice

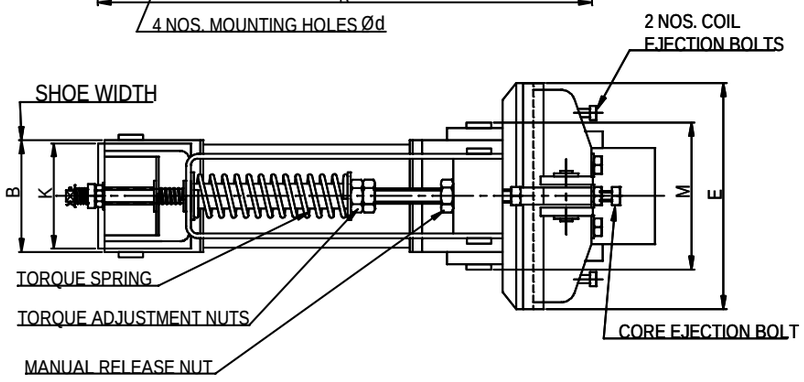


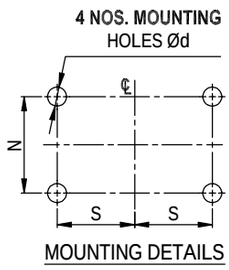


MOUNTING DETAILS

Brake Type	Drum Dia 'D'	A	B	E	F	H	K	M	R	S	T	h	Ød	Wt. (Kg.) (Approx.)
KBD-100/100	100	385	70	136	228	269	40	80	250	110	5	100	13	18
KBD-150/150	150	435	70	180	252	348	50	85	345	155	10	140	13	23
KBD-160/150	160	445	70	180	257	348	50	85	345	155	10	140	13	23
KBD-150/200	150	480	70	180	304	348	50	85	345	155	10	140	13	27
KBD-160/200	160	490	70	180	309	348	50	85	345	155	10	140	13	27
KBD-200/100	200	502	90	136	298.5	414	60	95	400	175	10	170	18	30
KBD-200/200	200	555	90	180	325	432.5	60	95	400	175	10	170	18	42
KBD-250/200	250	620	110	180	365	482.5	70	115	474	220	10	200	18	50
KBD-250/300	250	662	110	225	408	520	70	115	474	220	10	200	18	75
KBD-300/200	300	705	140	180	404	577.5	80	140	540	250	12	240	22	75
KBD-300/300	300	745	140	225	440	591	80	140	540	250	12	240	22	100
KBD-315/300	315	775	140	225	467.5	591	80	140	540	250	12	240	22	100

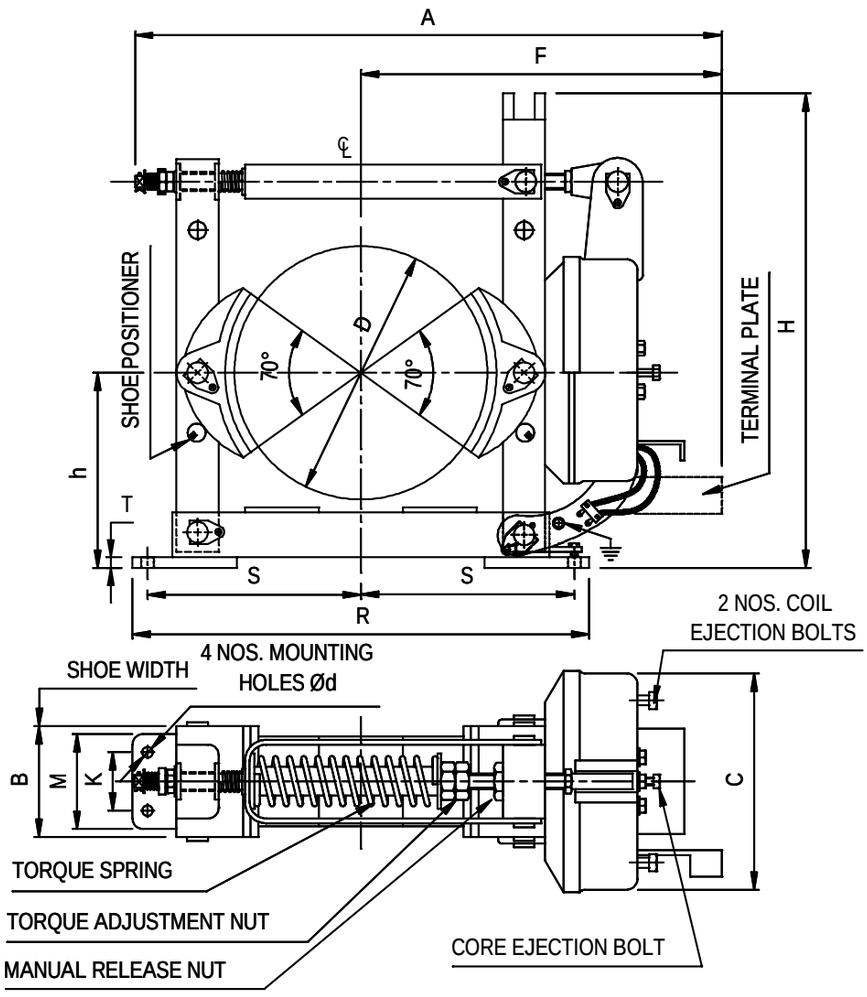


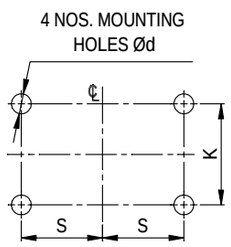




MOUNTING DETAILS

Brake Type	Drum Dia 'D'	A	B	E	F	H	h	K	M	N	0	R	S	Ød	Wt. (Kg) (Approx.)
KBD-400	400	990	180	348	550	660	320	120	265	90	480	780	170	25	264
KBD-500	500	1058	200	428	600	815	400	140	290	100	540	915	205	25	367
KBD-600	600	1261	240	510	698	945	475	170	345	126	640	1090	250	38	647
KBD-630	630	1291	240	510	713	945	475	170	345	126	655	1120	265	38	667
KBD-700	700	1468	280	596	840	1105	550	200	390	150	710	1215	305	38	942
KBD-800	800	1523	320	676	938	1230	600	230	421	180	844	1420	350	38	1345





MOUNTING DETAILS

Brake Type	Drum Dia 'D'	A (Approx.)	B	C	F (Approx.)	H	h	K	M	R	S	T	Ød	Wt. (Kg.) (Approx.)
KBD-200 (M)	200	576	90	210	365	440	170	60	95	400	175	10	18	42
KBD-250 (M)	250	648	110	210	407	498	200	70	115	474	220	10	18	
KBD-300 (M)	300	762	140	282	467	590	240	80	140	540	250	12	22	100

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