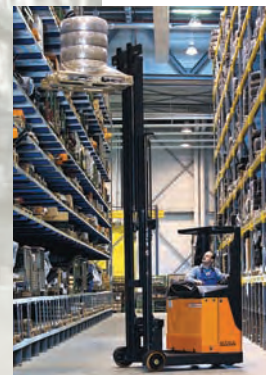


Forklift Truck Brakes



 **Warner**
Electric

 **Matrix**
International

Altra Industrial Motion

Warner Electric

Electromagnetic Clutches and Brakes - USA

South Beloit, IL 61080
815-389-3771

For application assistance:
1-800-825-9050

Electromagnetic Clutches and Brakes - Europe

St Barthelemy d'Anjou, France
+33 (0)2 41 21 24 24

For sales office:
+33 (0)2 41 21 24 76

Precision Electric Coils and Electromagnetic Clutches and Brakes - USA

Columbia City, IN 46725
260-244-6183

Inertia Dynamics

Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes

Torrington, CT 06790
860-482-4444

Matrix International

Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes

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+44 (0) 1356 602000

Warner Linear

Linear Actuators and Guideways - USA

Belvidere, IL 61008
815-547-1106

For application assistance:
1-800-825-9050

Boston Gear

Enclosed and Open Gearing, Electrical and Mechanical P.T. Components, Precision Gearheads, Precision Couplings

Quincy, MA 02171
617-328-3300

For customer service:
1-888-999-9860

For application assistance:
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Huco Dynatork

Precision Couplings and Air Motors

Hertford, England
+44 (0) 1992 501900

Formsprag Clutch

Overrunning Clutches and Holdbacks

Warren, MI 48089
586-758-5000

For application assistance:
1-800-927-3262

Marland Clutch

Roller Ramp and Sprag Type Overrunning Clutches and Backstops

Burr Ridge, IL 60527
630-455-1752

Stieber Clutch

Overrunning Clutches and Holdbacks

Heidelberg, Germany
+49 (0)6221 30 47 0

Wichita Clutch and Industrial Clutch

Pneumatic and Oil Immersed Clutches and Brakes - USA

Wichita Falls, TX 76302
940-723-3400

Pneumatic Clutches and Brakes - Europe

Bedford, England
+44 (0)1234 350311

Twiflex Limited

Caliper Brakes and Thrusters

Twickenham, England
+44 (0) 20 8894 1161

Ameridrives Couplings

Gear Couplings, Mill Spindles, Universal Joints

Erie, PA 16512
814-480-5000

Bibby Transmissions

Disc, Gear, Grid Couplings, Overload Clutches

Dewsbury, England
+44 (0) 1924 460801

Nuttall Gear and Delroyd Worm Gear

Worm Gear and Helical Speed Reducers

Niagara Falls, NY 14302
716-298-4100

Saftek Friction

Non-asbestos Brake and Clutch Materials

Telford, England
+44 (0) 1952 581122

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Taiwan	886 2 2577 8156
Singapore	65 487 4464
Thailand	66 2 322 5527
Australia	612 9894 0133
S. Africa	27 11 918 4270



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A Variety of Brake Solutions to meet specific Forklift Applications



Electric Counter Balance

- PK35 (2 per truck)
- PK60 (2 per truck)



Ride On Pallet Truck

- ERD35
- ERD35H
- PK20
- PK60
- ERD60HBF



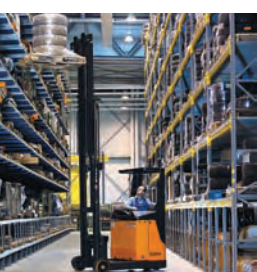
High Level Order Picker

- ERD35
- PK20
- ERD35H
- PK60
- VARISTOP



Stacker

- PK35
- PK60
- ERD60HBF
- Single face LWB
- Multidisc LWB
- PK10
- ERD20



Reach Truck

- PK35
- ERD60HBF
- Single faced LWB
- Multidisc LWB



Very Narrow Aisle

- Varistop
- LWB

The Warner Electric/Matrix International Family of Forklift Brakes



ERD

Electrically Released Brake
Parking and stopping standard brake



ERD H

Hydraulic Amplified
Electrically Released Brake
Parking and stopping brake-variable depending on load weight



ERD HBF

Electrically Released
Bifunctional Brake
Parking and stopping brake actuated by driver



LWB

Load Wheel Brake
Stopping brake inside frontwheel actuated by driver



PK

Spring-Applied
Motor Brake
Parking and stopping low profile brake



Varistop

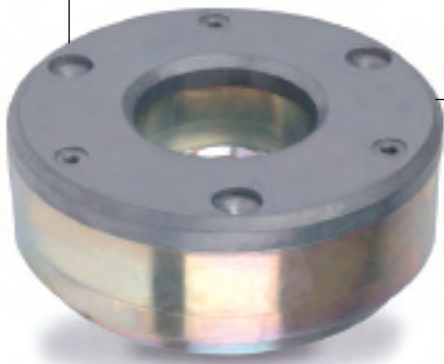
Motor Brakes
Variable torque motor brake and parking brake



LWB



Load Wheel Brake



Electrically applied forklift load wheel brake

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Forklift Applications

- Very Narrow Aisle

Warner Electric/Matrix International provides the highest quality forklift truck brakes engineered to meet your requirements. We offer production, engineering and application support from our facilities in Europe, the U.S. and China. Contact us today to discuss how our dedicated engineers can assist you.

- Compact design fits inside load wheel
- Operator controlled variable torque
- High torque to size ratio
- Single disc and multi-disc versions
- Zero drag torque

For Technical Assistance Call

800-825-9050



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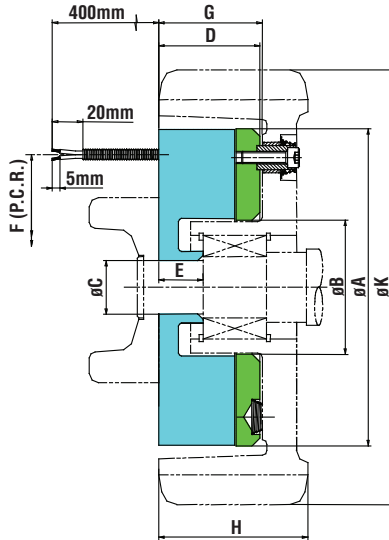


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LWB

Electrically Applied Forklift Brake



Model / Size		4EB070	4EB090
Rated Dynamic Torque	(lb.ft)	332	516
Power (@20C) 24 VDC	(Watts)	72	124
A	(mm)	208	256
B	(mm)	88	117
C (H8)	(mm)	35	40
D	(mm)	66,2	78,5
E	(mm)	29	45
F	(mm)	87	111
G	(mm)	67	79,7
H	(mm)	100	106
K	(mm)	285	355



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ERD H

Hydraulic Amplified Electrically Released Brake



***Parking and
stopping brake -
torque proportional
to load weight***

The Electro-Release Hydraulic Amplified (ERDH) brake is a performance enhanced ERD failsafe brake. A hydraulic piston is integrated in the shell of the mast cylinder. The hydraulic force applied is proportional to the load on the fork. The spring force is defined for the truck unloaded and at full speed. By combining spring force and hydraulic force, you reach the optimal torque required for the specified deceleration rate and stopping distance. The torque applied increases as the weight of the load increases.

The ERDH is particularly suitable for ride-on trucks with high load capacity such as order pickers and pallet trucks.

Forklift Applications

- Ride on Pallet Truck
- Low Level Order Picker

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- Torque capacities 20 to 100 Nm
- Actuated by spring pressure and hydraulic pressure proportional to the load
- For dry use
- For vertical and horizontal use
- Thick plate available
- Wear adjustment
- Adjusting torque by springs
- Complete range of adaptable hydraulic booster

For Technical Assistance Call

800-825-9050



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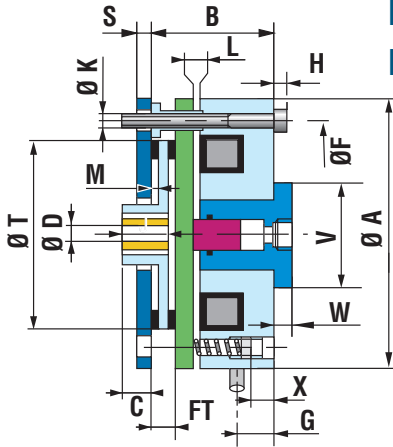


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ERD H

Hydraulic Amplified Electrically Released Brake



Size	020	035	060	100
Max. combined torque [Nm]	20	35	60	100
Spring torque [Nm]	To be defined with the customer			
Hydraulic torque [Nm]	To be defined with the customer			
Max. speed [min ⁻¹]	3600			
Nom. current at 20 °C A [24 VDC ±30%]	1,22	1,61	1,94	2,35
A [mm]	127	147	162	188
B [mm]	47,5	54,5	64	71
C [mm]	14,2	17	21	21
D [mm]	15/20/22	20/24/25	25/30	25/30/35
F [mm]	112	132	145	170
FT [mm]	9,8	11	12	12
G [mm]	15,5	19,7	19	22
H [mm]	8	8	10	10
K [mm]	3 x M6	3 x M6	3 x M8	3 x M8
L nominal [mm]	0,4	0,4	0,5	0,6
M [mm]	4	3	3	3
S Thick flange [mm]	9	9	11	11
S Inter. flange [mm]	4	5	5	6
T [mm]	96	116	125	150
V On flat [mm]	50	50	50	50
W [mm]	11	11	7	7
Inertia (Metal only) [kgcm ²]	2,8	7,4	21,7	36,5
Weight [kg]	3,65	5,25	7,05	10,7
Max. hydraulic pressure [bar]	160			
Ambient temperature [°C]	-20 / +60			



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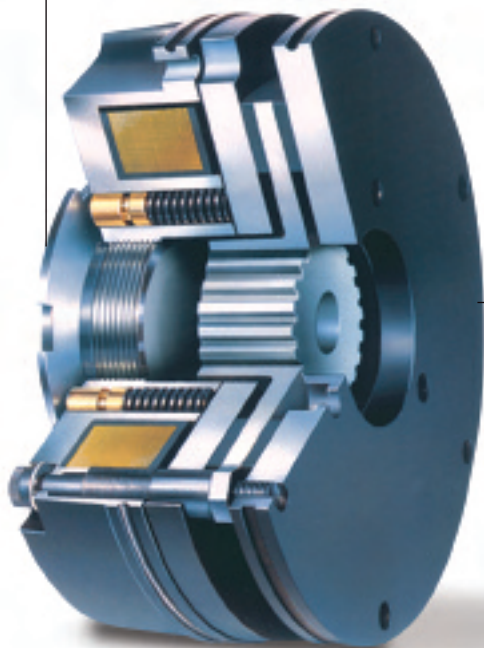
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ERD

Electrically Released Forklift Brake



Parking and stopping standard brake

The Electro-Released Dynamic brake (ERD) is a failsafe brake designed for dynamic applications. It is an on/off dry failsafe brake. Torque value is defined for the trucks running at full speed and at full load. With high heat dissipation capabilities and adjusting spacers, it is particularly suitable for trucks which require frequent dynamic braking. The brake coil is encapsulated and is UL class F compliant. Friction material is organic.

Forklift Applications

- Walk Behinds
- Stacker
- Ride on Pallet Truck
- Low Level Order Picker

Warner Electric/Matrix International is a world leader in the design and manufacture of hydraulic, pneumatic and electromagnetic brakes and clutches for battery powered vehicles. We offer a full range of traction motor and load wheel brakes and specialize in customized solutions to meet your specific performance and installation requirements. We have over 60 years of experience delivering high technology, cost effective braking systems. We offer production, engineering and application support from our facilities in Europe, the U.S. and China. Contact us today to discuss how our dedicated engineers can assist you.

- Torque capacities 5 to 300 Nm
- 8 different sizes
- Bi-directional stopping capability
- Spring applied brake
- Fully dynamic braking
- Wear and torque adjustments
- Hand release option
- Dust cover option
- Thick / intermediate / thin flange
- Variety of voltage available

For Technical Assistance Call

800-825-9050



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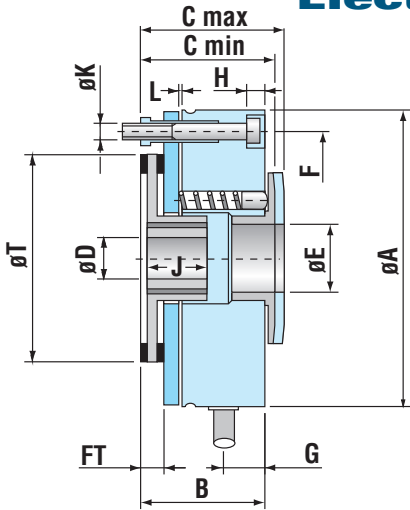


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ERD

Electrically Released Forklift Brake



Size		005	010	020	035	060	100	170
Nominal torque	[Nm]	5	10	20	35	60	100	170
Max speed	[RPM]	5000	5000	5000	5000	5000	3600	3600
Power (P20) 24 VDC	[W]	20	25	30	39	47	57	66
A	[mm]	84	102	127	147	162	188	215
B	[mm]	35	41	47,5	54,5	64	71	83
C min.	[mm]	38,5	44,5	52	61	70	77	89
C max.	[mm]	40	46,5	55,5	65	74,5	81,5	96
D prebore	[mm]	8	10	10	14	14	15	20
D standard H7	[mm]	10/11	10/14/ 15*	15/20/ 22/24*	20/24/ 25	25/30	25/30/ 35	35/40/ 45
D max*	[mm]	12*	15*	24*	28*	32*	40*	50*
E	[mm]	19	24	35	40	48	52	60
F	[mm]	72	90	112	132	145	170	196
FT	[mm]	6,5	8,2	9,8	11	12	12	14,7
G	[mm]	11,7	14,6	15,5	19,7	19	22	27
H	[mm]	5,1	6,4	5,8	7,3	8,7	11	13
J $0^{+0,2}$	[mm]	18	20	20	25	30	30	35
K	-	3 x M4	3 x M5	3 x M6	3 x M6	3 x M8	3 x M8	6 x M8
L nom.	[mm]	0,2	0,2	0,2	0,3	0,3	0,3	0,3
T	[mm]	60	77	96	116	125	150	174
Weight	[kg]	0,9	1,7	3	4,6	6,4	9,9	15,6
Connection	-	Cable (400 mm)						



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 E-mail: sales@matrix-international.com



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PK

Electrically Released Brake



Parking and stopping standard brake

Forklift Applications

- Walk Behinds
- Stacker
- Ride on Pallet Truck
- Low Level Order Picker
- High Level Order Picker
- Reach Truck
- Electric Counter Balance

Warner Electric/Matrix International is a world leader in the design and manufacture of hydraulic, pneumatic and electromagnetic brakes and clutches for battery powered vehicles. We offer a full range of traction motor and load wheel brakes and specialize in customized solutions to meet your specific performance and installation requirements. We have over 60 years of experience delivering high technology, cost effective braking systems. We offer production, engineering and application support from our facilities in Europe, the U.S. and China. Contact us today to discuss how our dedicated engineers can assist you.

The Pan-Cake (PK) range is a pre-assembled on/off dry failsafe electromagnetic brake. This failsafe brake is used for parking and emergency only. The AC motor is used in combination with the PK brake for regenerative braking of the truck. The brake uses a high coefficient of friction material and powerful coil to optimize torque in a low profile package. The coil is linked with a pulse width modulation power supply to reduce power consumption and maintenance.

The benefits of this cost competitive range include; one piece design for easy assembly, lower power consumption, longer battery life, and overall lower maintenance costs. The low profile design is particularly suitable for back to back dual drive configurations such as sit trucks and boom lifts.

- High torque within a compact space envelope
- Multi-step braking versions available
- Low profile space saving design
- Dust cover option

For Technical Assistance Call

800-825-9050



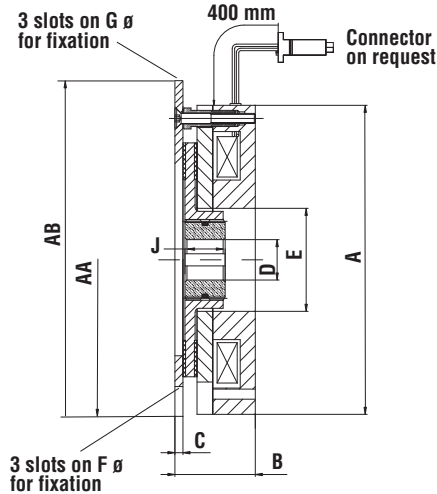
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Electrically Released Brake



Size	010	020	035	060	100
Static Torque (Nm)	20	40	75	125	200
Static Torque (lb. ft)	14.8	29.5	55.3	92.2	147.5
A	96	133	153	164	184
B	39.7	43	43	59	75
C	3.2	4.5	6	6	10
D	15/20H7	15/20H7	19.05/20/25H7	20/25/30H7	25/30/35H7
J	20	20	25	30	30
E	28.5	43.5	51	59	70
F	90	112	132	145	170
G	112	132	145	170	196
AA small Flange	96	133	153	164	184
AB large Flange	115	138	178	185	215
Ambient Temperature	Minus 20 Plus 60 Degree C				
Voltage	Pulse Width Modulation - based on customer requirements				



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ERD HBF

Electrically Released Bi-functional Brake



Parking and stopping brake actuated by driver

The Electro-Release Bi-functional Brake (ERDHBF) is based on the Electro-Release Hydraulic amplified brake type ERDH. A low-magnetic moving armature is added between the armature and the friction disc assembly. The force generated by the hydraulic piston is applied directly to the armature. By monitoring the hydraulic pressure via a foot pedal or a lever handle, a hydraulic service brake combined with an electromagnetic failsafe brake is obtained. The major benefit is improved service braking force.

Forklift Applications

- Ride on Pallet Truck
- Reach Truck

Warner Electric/Matrix International is a world leader in the design and manufacture of hydraulic, pneumatic and electromagnetic brakes and clutches for battery powered vehicles. We offer a full range of traction motor and load wheel brakes and specialize in customized solutions to meet your specific performance and installation requirements. We have over 60 years of experience delivering high technology, cost effective braking systems. We offer production, engineering and application support from our facilities in Europe, the U.S. and China. Contact us today to discuss how our dedicated engineers can assist you.

The ERDHBF is particularly suitable for demanding reach trucks, very high load capacity ride on trucks and counterbalance trucks.

- Torque capacities 20 to 150 Nm
- Parking brake actuated by spring pressure
- Working brake actuated by foot pedal
- For dry use
- For vertical and horizontal use
- No residual torque
- Cable or hydraulic actuator
- Complete range of adaptable hydraulic booster

For Technical Assistance Call

800-825-9050



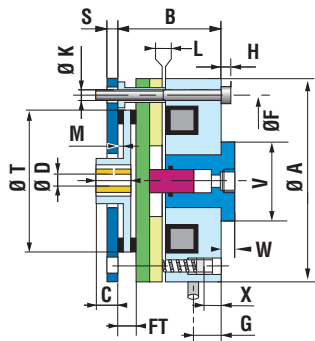
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ERD HBF



Electrically Released Bi-functional Brake

Size		020	035	060	100
Size		020	035	060	100
Max. combined torque - Emergency stop condition [Nm]		40	70	120	200
Max. spring torque - Parking condition [Nm]		20	35	60	100
Max. hydraulic torque - Driver torque via pedal [Nm]		20	35	60	100
Max. speed [min ⁻¹]		3600			
Nom. current at 20 °C A [24 VDC ±30%]		1,22	1,61	1,94	2,35
A	[mm]	127	147	162	188
B	[mm]	47,5	54,5	64	71
C	[mm]	14,2	17	21	21
D	[mm]	15/20/22	20/24/25	25/30	25/30/35
F	[mm]	112	132	145	170
FT	[mm]	9,8	11	12	12
G	[mm]	15,5	19,7	19	22
H	[mm]	8	8	10	10
K	[mm]	3 x M6	3 x M6	3 x M8	3 x M8
L nominal	[mm]	0,3	0,3	0,3	0,3
M	[mm]	4	3	3	3
S Thick flange	[mm]	9	9	11	11
S Intermediate flange	[mm]	4	5	5	6
T	[mm]	96	116	125	150
V On flat	[mm]	50	50	50	50
W	[mm]	11	7	7	7
Inertia (Metal only) [kgcm ²]		2,8	7,4	21,7	36,5
Weight [kg]		4,25	6,25	8,25	12,7
Max. hydraulic pressure [bar]		50			
Ambient temperature [°C]		-20 / +60			



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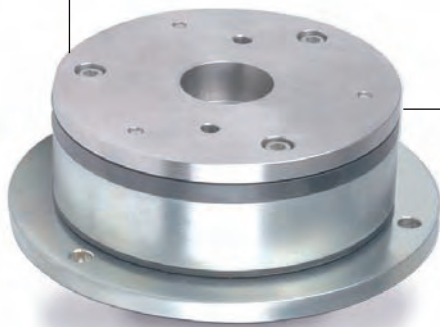
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VARISTOP

Motor Brakes



Forklift Applications

- High Level Order Picker
- Very Narrow Aisle

Variable torque motor and parking brakes

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Warner Electric/Matrix International provides the highest quality forklift truck brakes engineered to meet your requirements. We offer production, engineering and application support from our facilities in Europe, the U.S. and China. Contact us today to discuss how our dedicated engineers can assist you.

- Variable torque braking
- Automatic wear adjustment
- Dynamic braking
- Zero-power parking brake

For Technical Assistance Call

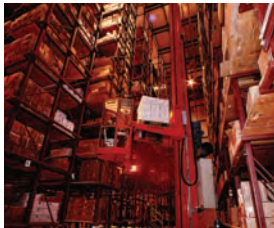
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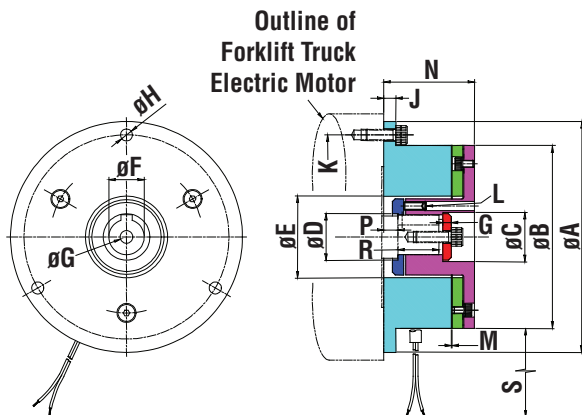


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VARISTOP

Motor Brakes



Size/Model	52PMB050-01	
Rated Dynamic Torque	(lb.ft)	32
Max. Speed	(RPM)	3000
Nominal Current to Release Brake (@20C) 48 VDC	(Amps)	0,47
A	(mm)	164
B	(mm)	130
C	(mm)	35
D	(mm)	33
E	(mm)	58
F standard H7 (Keyway)	(mm)	25 8 x 3,3
G	(mm)	9
H	(mm)	3 x 8,5
J	(mm)	8,5
K	(mm)	145
L	(mm)	3 x M6
M (nominal)	(mm)	0,30
N	(mm)	64,15
P	(mm)	10
R	(mm)	29
S	(mm)	400



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