

DAF-DRK SERIES

ELECTROMAGNETIC BRAKE
& CLUTCH SYSTEMS

Areas of Application

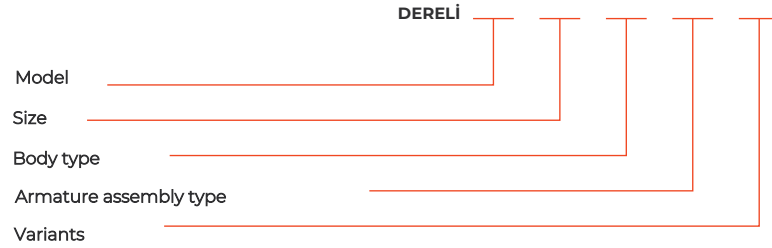
- | Automation systems
- | Automatic door systems
- | Printing machines
- | Textile machines
- | Conveyor belt systems
- | Packaging systems
- | Turnstile entry systems



DAF-DRK

AREAS OF APPLICATIONS

Product Key



Model

DRK – Current Applied Clutch**DAF** – Current Applied Brake

Size

01, 02, 03, 04, 05, 06, 07, 08*, 09*, 10*

Body Type

1 – Body with Flange**3** – Body with Bearing

Armature Assembly Type

1 – Armature Flange (Throat Outer)**2** – Armature Flange (Throat Inner)***3** – Pressure Flange

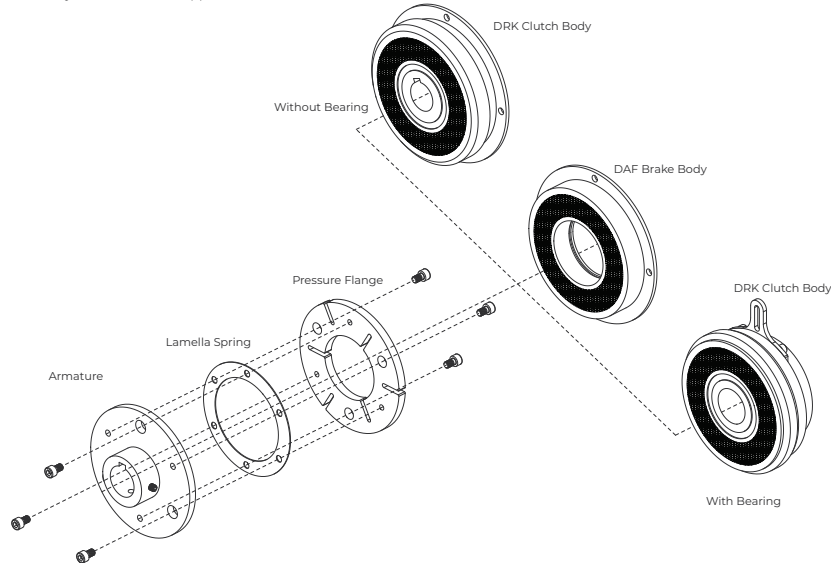
Variants

Supply Voltage [V]

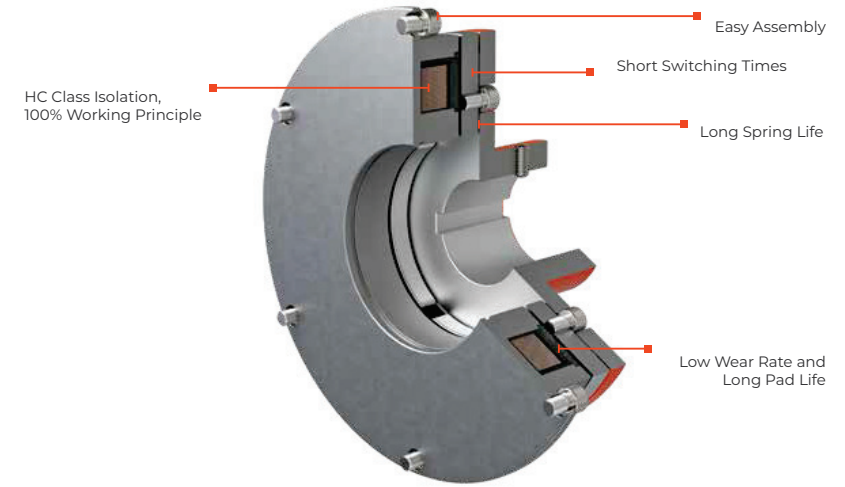
Rotor Diameter Ø [mm]

Armature Hub Diameter Ø [mm]

* only valid for current applied brake.



Product Features

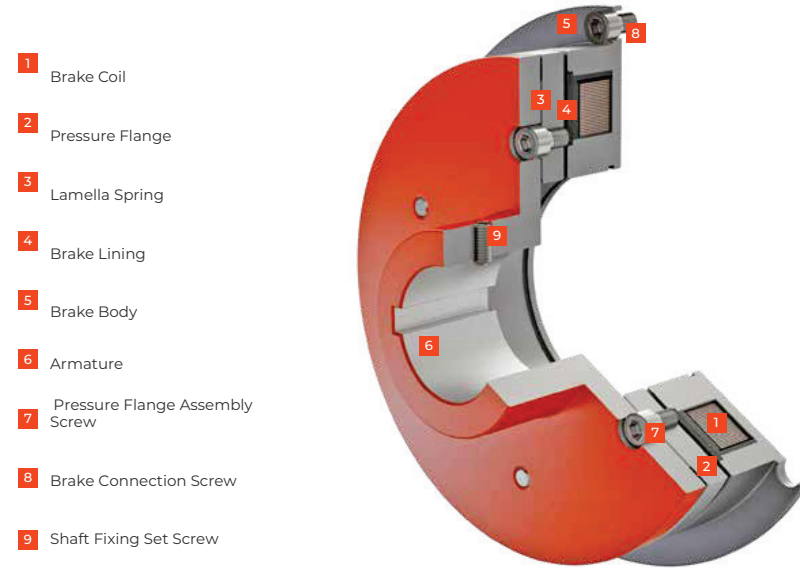


- | Torque in the range of 8 – 2500 Nm
- | 10 different sizes
- | 3 different design option according to the application area
- | Standart voltage 24 V
- | Designed modular structure and easy assembly for applications
- | HC class enamel coil wire insulation (200 °C)
- | Metal parts are coated to resist corrosion
- | Brake coil insulated with epoxy resin
- | Short switching times
- | Brake operating sound level < 70 Db
- | Asbestos-free, low wear rate and long life linings
- | It is designed according to 100% working principle

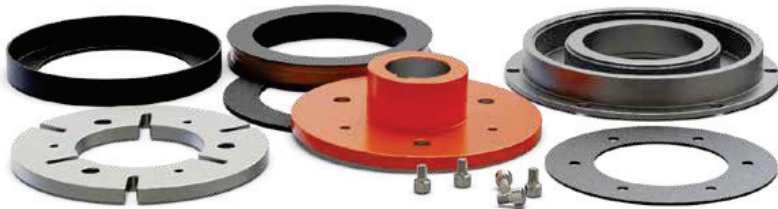
Areas of Application

- | Automation systems
- | Automatic door systems
- | Printing machines
- | Textile machines
- | Conveyor belt systems
- | Packaging systems
- | Turnstile entry systems

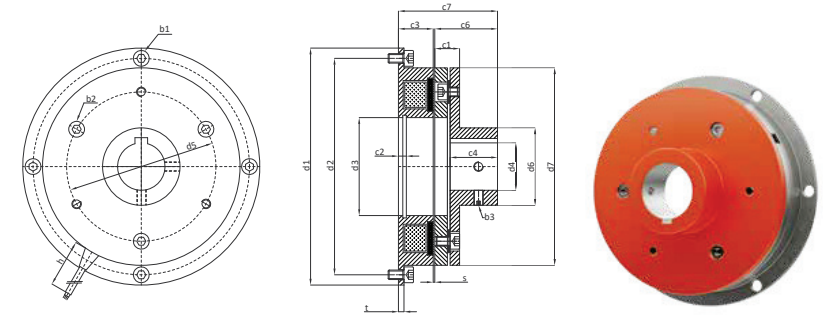
DAF Current Applied Brake Series Operating Principles



DAF series brakes are current applied brakes and do the braking when energy applied. When energy applies to the brake coil (1), the coil becomes an electromagnet, which creates a magnetic flux. This magnetic flux ensures the pressure flange (2) to pull towards the brake coil and braking. When the energy is cut off, the lamella spring (3), which is connected to the pressure flange, separates the pressure flange from the brake coil and ensures finish the braking.



DAF Current Applied Brake Series Assembly Dimensions



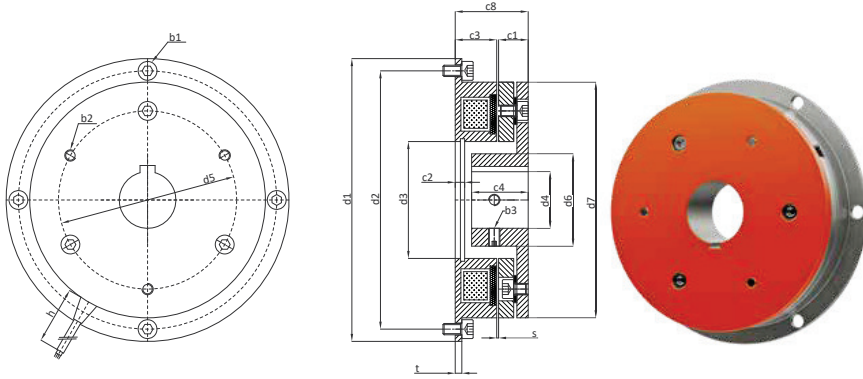
| Design 1.1

Size	M _k [Nm]	P ₂₀ [W]	b1	b2	b3	c1	c2	c3	c4	c6	c7
DAF01	8	13	M4x4	M4x6	M4x2	9,4	3,5	18	16	21,4	39,6
DAF02	16	20	M5x4	M4x6	M4x2	11,5	4,5	20	20	25,5	45,8
DAF03	32	25	M6x4	M5x6	M5X2	12,6	5	22	25	31,6	53,8
DAF04	65	33	M6x4	M5x6	M6X2	14,8	5	24	30	38,8	63,1
DAF05	120	45	M8x4	M6x6	M6X2	20	6	26	40	51	77,3
DAF06	240	55	M10x6	M8x6	M8X2	23,5	7	30	50	62,5	92,9
DAF07	480	70	M10x6	M12x6	M10X2	27	8	35	55	14	104,8
DAF08	800	ON REQUEST									
DAF09	1500										
DAF10	2500										

Size	d1	d2	d3	d4 (max) (H7)	d4* (j7)	d5	d6	d7	h	s	t	Weight [kg]
DAF01	80	72	35	16	10	50	29	63	400	0,2	2	0,25
DAF02	100	92	42	25	10	60	38	80		0,3	2,5	0,50
DAF03	125	112	52	28	16	76	42	100		0,3	3	1,2
DAF04	150	137	62	30	16	94,5	49	125		0,3	3,5	2,2
DAF05	190	175	80	42	24	118	65	160		0,3	4	4,5
DAF06	230	215	100	52	24	134	92	200		0,4	5	6
DAF07	290	270	125	70	24	210	105	250		0,8	6	10
DAF08	ON REQUEST											
DAF09												
DAF10												

| Dimensions in mm
Standard keyway according to DIN 6885/1-359
| Standard voltage 24 V DC
| d4*: j7 pilot hole

DAF Current Applied Brake Series Assembly Dimensions



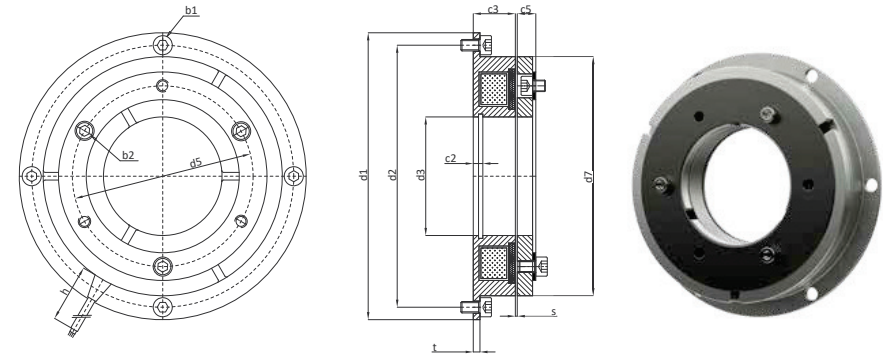
Dizayn 1.2 | Design 1.2

Size	M _k [Nm]	P ₃₀ [W]	b1	b2	b3	c1	c2	c3	c4	c8	d1
DAF01	8	13	M4x4	M4x6	M4x2	9,4	3,5	18	16	27,6	80
DAF02	16	20	M5x4	M4x6	M4x2	11,5	4,5	20	20	31,8	100
DAF03	32	25	M6x4	M5x6	M5x2	12,6	5	22	25	34,8	125
DAF04	65	33	M6x4	M5x6	M6x2	14,8	5	24	30	39,1	150
DAF05	120	45	M8x4	M6x6	M6x2	20	6	26	40	46,3	190
DAF06	240	55	M10x6	M8x6	M8x2	23,5	7	30	50	53,9	230
DAF07	480	70	M10x6	M12x6	M10x2	27	8	35	55	59,8	290
DAF08	800	ON REQUEST									
DAF09	1500										
DAF10	2500										

Size	d2	d3	d4 (max) (H7)	d4* (J7)	d5	d6	d7	h	s	t	Weight [kg]
DAF01	72	35	16	10	50	29	63	400	0,2	2	0,25
DAF02	92	42	25	10	60	38	80		0,3	2,5	0,50
DAF03	112	52	28	16	76	42	100		0,3	3	1,2
DAF04	137	62	30	16	94,5	49	125		0,3	3,5	2,2
DAF05	175	80	42	24	118	65	160		0,3	4	4,5
DAF06	215	100	52	24	134	92	200		0,4	5	6
DAF07	270	125	70	24	210	105	250		0,8	6	10
DAF08	ON REQUEST										
DAF09											
DAF10											

† Dimensions in mm
 ‡ Standard keyway according to DIN 6885/1-359
 § Standard voltage 24 V DC
 ¶ d4*: J7 pilot hole

DAF Current Applied Brake Series | Assembly Dimensions



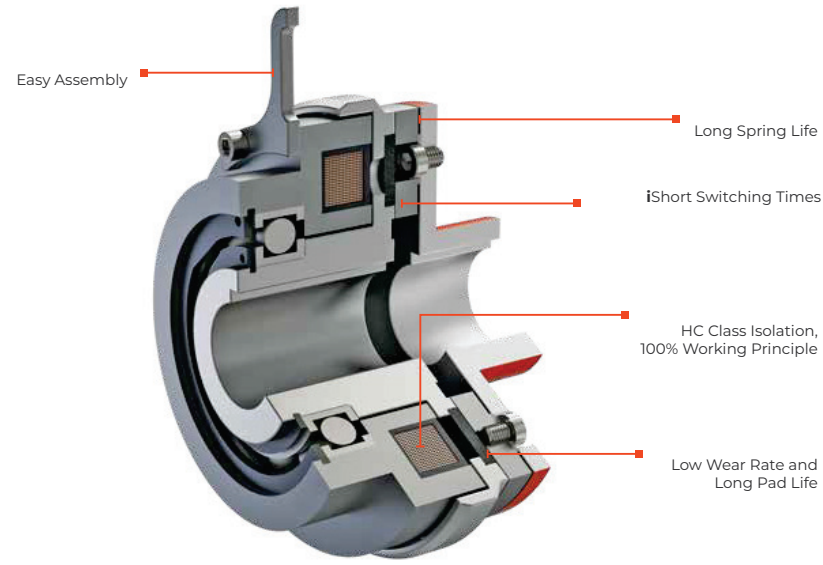
Design 1.3

Size	M _k [Nm]	P ₃₀ [W]	b1	b2	c2	c3	c5	d1
DAF01	8	13	M4x4	M4x6	3,5	18	5,4	80
DAF02	16	20	M5x4	M4x6	4,5	20	5,5	100
DAF03	32	25	M6x4	M5x6	5	22	6,6	125
DAF04	65	33	M6x4	M5x6	5	24	8,8	150
DAF05	120	45	M8x4	M6x6	6	26	11	190
DAF06	240	55	M10x6	M8x6	7	30	12,5	230
DAF07	480	70	M10x6	M12x6	8	35	14	290
DAF08	800	ON REQUEST						
DAF09	1500							
DAF10	2500							

Size	d2	d3	d5	d7	h	s	t	Weight [kg]
DAF01	72	35	50	63	400	0,2	2	0,25
DAF02	92	42	60	80		0,3	2,5	0,50
DAF03	112	52	76	100		0,3	3	1,2
DAF04	137	62	94,5	125		0,3	3,5	2,2
DAF05	175	80	118	160		0,3	4	4,5
DAF06	215	100	134	200		0,4	5	6
DAF07	270	125	210	250		0,8	6	10
DAF08	ON REQUEST							
DAF09								
DAF10								

† Dimensions in mm
 ‡ Standard keyway according to DIN 6885/1-359
 § Standard voltage 24 V DC

DRK Current Applied Clutch Series Product Key

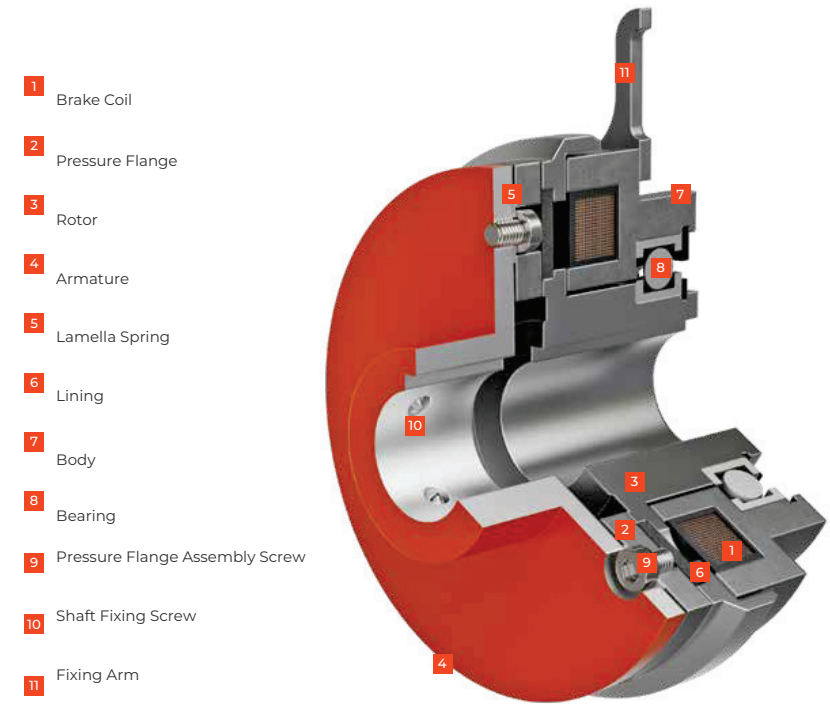


- | Torque in the range of 8 - 480 Nm
- | 7 different sizes
- | 4 different design option according to the application area
- | Standart voltage 24 V
- | Designed modular structure and easy assembly for applications
- | IP 20 protection class
- | HC class enamel coil wire insulation (200 °C)
- | Metal parts are coated to resist corrosion
- | Brake coil insulated with epoxy resin
- | Short switching times
- | Brake operating sound level < 70 dB
- | Asbestos-free, low wear rate and long life linings
- | It is designed according to 100% working principle

Areas of Application

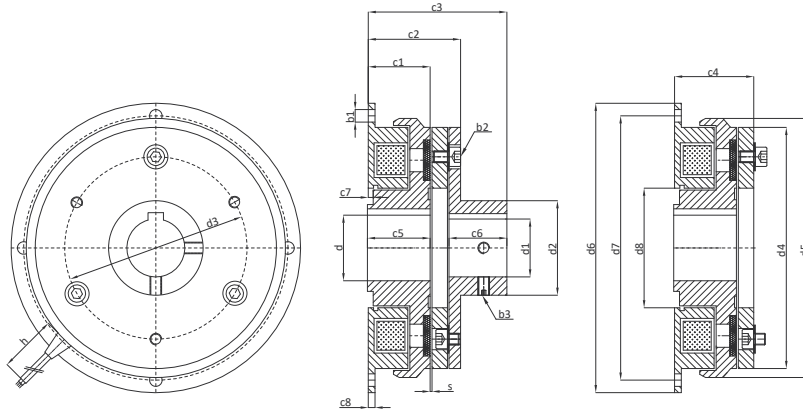
- | Automation systems
- | Automatic door systems
- | Printing machines
- | Textile machines
- | Conveyor belt systems
- | Packaging systems
- | Balancing machines

DRK Current Applied Clutch Series Product Features



DRK series brakes are current applied clutches. When energy applies to the brake coil (1), the coil becomes an electromagnet, which creates a magnetic flux. This magnetic flux ensures the pressure flange (2) to pull towards the brake coil, allows shaft and armature (4) to rotate at the same speed. When the energy is cut off, the pressure flange returns to its former position due to the lamella spring (5) and the shafts rotate independently of each other.

DRK Current Applied Clutch Series Assembly Dimensions



Without Bearing

Design 1.1

Design 1.3



Design 1.1



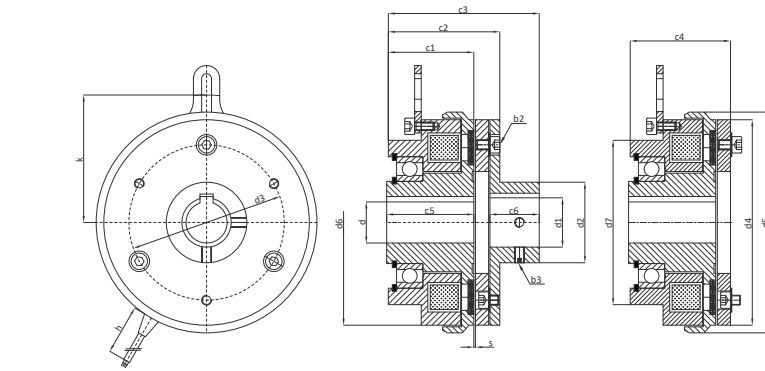
Design 1.3

Size	M _k [Nm]	P ₃₀ [W]	b1	b2	b3	c1	c2	c3	c4	c5	c6	c7	c8	d (max) (H7)
DRK01	8	18	M4x4	M3x6	M4x2	24,3	34	46	29,5	22,5	16	3,8	2	15
DRK02	16	24	M5x4	M4x6	M4x2	26,5	36,2	58,5	31,7	24	26,2	5,5	2,5	20
DRK03	32	32	M6x4	M5x6	M5x2	28,5	41,3	60,3	34,7	26	25	5,5	3	25
DRK04	65	38	M6x4	M6x6	M6x2	35	50,2	74,2	43,4	30,5	30	7,5	3,5	35
DRK05	120	55	M8x4	M6x6	M6x2	36	56,2	87,2	46,4	33	40	7	4	45
DRK06	240	72	M10x6	M8x6	M8x2	41,9	65,9	104,9	53,9	38	50	7,85	5	55
DRK07	480	87	M10x6	M12x8	M10x2	51,5	80,3	122,3	66,3	47,5	55	9	6	70

Size	d* (J7)	d1 (max) (H7)	d1* (J7)	d2	d3	d4	d5	d6	d7	d8	h	s	Weight [kg]
DRK01	10	16	10	29	50	63	68	80	72	35	400	0,2	0,79
DRK02	10	25	10	38	60	80	85,5	100	90	42		0,2	1,2
DRK03	16	28	16	42	76	100	107	125	112	52		0,2	2,24
DRK04	16	30	16	49	94,5	125	134	150	137	62		0,4	3,86
DRK05	24	42	24	65	123,5	160	170	190	175	80		0,4	7
DRK06	24	52	24	92	134	200	214	230	215	100		0,5	13,3
DRK07	24	70	24	105	210	250	267	290	270	125		0,8	21,2

| Dimensions in mm
 | Standard keyway according to DIN 6885/1-359
 | Standard voltage 24 V DC
 | d*: J7 pilot hole
 | d1*: J7 pilot hole

DRK Current Applied Clutch Series Assembly Dimensions



With Bearing

Design 3.1

Design 3.3



Design 3.1



Design 3.3

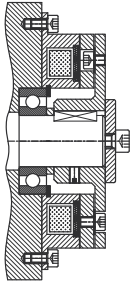
Size	M _k [Nm]	P ₃₀ [W]	b2	b3	c1	c2	c3	c4	c5	c6	d (H7)	d* (J7)	d1 (H7)
DRK01	8	18	M3x6	M4x2	39,5	50,2	62,2	45,7	40,5	16	15	10	16
DRK02	16	24	M4x6	M4x2	43	53	75,25	48,5	44	26,2	20	10	25
DRK03	32	32	M5x6	M5x2	44	57,1	76,1	50,5	45	25	25	16	28
DRK04	65	38	M6x6	M6x2	52	57,1	91,1	60,3	53	30	35	16	30
DRK05	120	55	M6x6	M6x2	61	81,2	112,2	71,4	62	40	45	24	42
DRK06	240	72	M8x6	M8x2	71,5	95,5	134,5	83,5	72,5	50	55	24	52
DRK07	480	87	M12x8	M10x2	74,5	103	145	89	73,5	55	70	24	70

Size	d1* (J7)	d2	d3	d4	d5	d6	d7	h	k	s	Weight [kg]
DRK01	10	29	50	63	68	80	54	400	40	0,2	0,79
DRK02	10	38	60	80	85,5	100	68		50	0,2	1,2
DRK03	16	42	76	100	107	125	85		62,5	0,2	2,24
DRK04	16	49	94,5	125	134	150	100		77,5	0,4	3,86
DRK05	24	65	123,5	160	170	190	127		97,5	0,4	7
DRK06	24	92	134	200	214	230	152,4		121,5	0,5	13,3
DRK07	24	105	210	250	267	290	162		148	0,8	21,2

| Dimensions in mm
 | Standard keyway according to DIN 6885/1-359
 | Standard voltage 24 V DC
 | d*: J7 pilot hole
 | d1*: J7 pilot hole

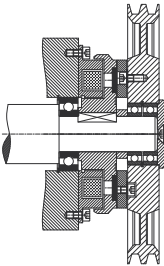
Assembly Applications

DAF 1.2 Assembly Type



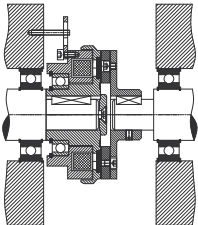
In DAF series brakes, it is an assembly type that allows stopping a rotating shaft at the desired time with current.

DRK 1.3 Assembly Type



In DRK series clutches, it is an assembly type that transfers the movement of a constantly rotating shaft to the pulley on the same shaft.

DRK 3.1 Assembly Type

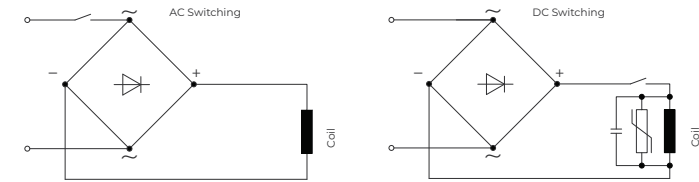


In DRK series clutches, it is an assembly type that allows the movement of a constantly rotating shaft to be transfer to another one shaft on the same axis.

Switching Times

Electrical Connection

DAF brakes and DRK clutches needs DC current to operate. Coil voltage shows on the product information label ($\pm 7\%$ tolerance). It is possible to operate the brake / clutch with a rectifier or other suitable DC power supply. Connections can vary depending on brake / clutch equipment. Please make the connections according to the brake / clutch wiring diagram (DC switching in fast switching applications, AC switching in slow switching applications).



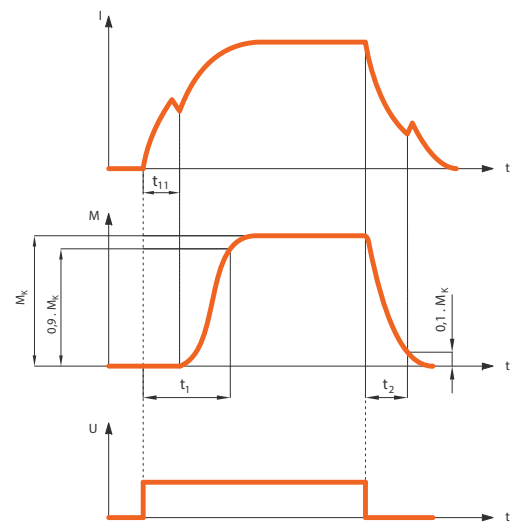
Switching Behaviours of Brakes / Clutches

The operating behavior of a brake / clutch is highly dependent on the switching mode used. Switching times are affected by temperature and the working gap between the pressure flange and the brake body. The switching behavior of the brakes / clutches depends on the wear of the linings. Therefore, the lining thickness should be checked periodically.

Size	M_k [Nm]	t_2 [ms]	DC Switching		P_{25} [W]
			t_1 [ms]	t_1 [ms]	
DAF01	8	10	6	24	13
DAF02	16	15	8	38	20
DAF03	32	50	10	42	25
DAF04	65	85	13	48	33
DAF05	120	100	15	85	45
DAF06	240	140	23	118	55
DAF07	480	200	35	155	70

Boyut Size	M_k [Nm]	t_2 [ms]	DC Anahtarlama DC Switching		P_{25} [W]
			t_1 [ms]	t_1 [ms]	
DRK01	8	14	14	48	18
DRK02	16	19	18	74	24
DRK03	32	40	23	81	32
DRK04	65	68	25	90	38
DRK05	120	100	29	161	55
DRK06	240	130	37	201	72
DRK07	480	200	55	295	87

Switching Times

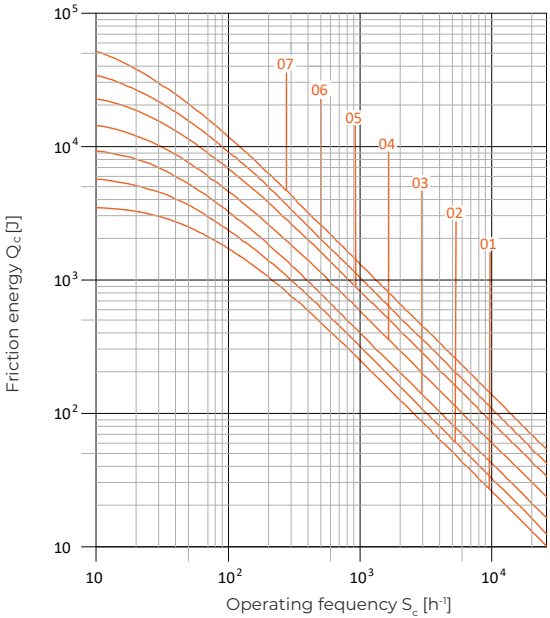


The operating times given are the times that valid for to the nominal torque and working gaps. These times states the average values.

Braking torque	[Nm]
Max. permissible switching cycle At DC switching, 100% on time and max. operating temperature 80 °C	[d/dk] [rpm]
Braking / clutching time Time from disconnecting the current to attaining 0,9 · Mk	[ms]
Braking / clutching delay time Time from disconnecting the current to rise of the torque	[ms]
Brake / clutch release time Time from current connection to 0,1 · Mk	[ms]
Time	[ms]
Current	[A]
Moment	[Nm]
Coil voltage	[V]

Technical Data

Friction Energy and Working Frequency



The operating frequency should also be considered when selecting brake / clutch. The maximum permissible operating frequency S_c depends on friction energy Q_c . Values in the diagram must not exceed because these values represent the maximum values.

* only valid for current applied brake DAF.

Analysis

As a result of mechanical, static, electromagnetic and thermal analysis for DAF-DRK series brakes, concluded that the brake designed within the framework of safe values.

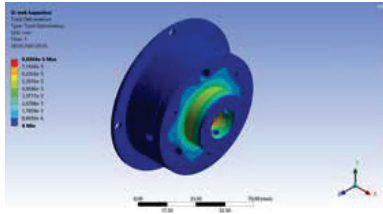


Figure 1. Braking force verification analysis (DAF)

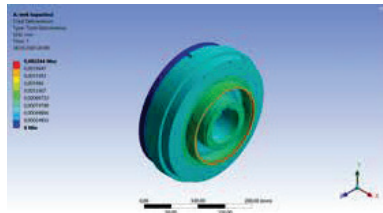


Figure 2. Clutching force verification analysis (DRK)

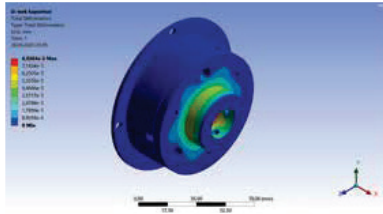


Figure 5. As a result of thermal analysis, temperature and its distribution (DAF)

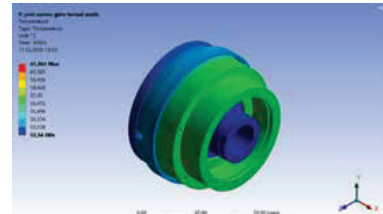


Figure 6. As a result of thermal analysis, temperature and its distribution (DRK)

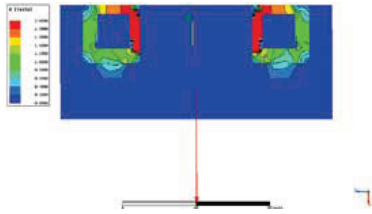


Figure 3. As a result of electromagnetic analysis, magnetic flux density and its distribution (DAF)

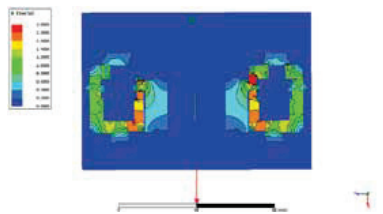


Figure 4. As a result of electromagnetic analysis, magnetic flux density and its distribution (DRK)

DAF Current Applied Brake Series

Product Overview

Size	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10
Model	☐ DAF 1.1		☐ DAF 1.2		☐ DAF 1.3		☐ DAF Motor Mounted			
Voltage	☐ 24 V									
Braking Torque	☐ 8 – 2500 Nm									
Mains voltage	☐ 230 V AC		☐ 400 V AC							
Rectifier	☐ Power Supply					☐ Isolation Transformer				
Protection class	☐ IP 40									
Shaft Diameter	☐ Ø.....mm H7 DIN 6885 Standard									
Keyway Standard	☐ I Standard (400 mm For All Sizes)									
Cable Length	☐ Special Length : mm									
Pressure Flange	☐ Standard					☐ Heat Treated				
Ambient Temperature	☐ + °C									
Mounting Kit	☐ ooled Type (Connection Type : ☐ Motor Cover									

DRK Current Applied Brake Series

Product Overview

Size	☐ 01 ☐ 07	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06
Model	☐ DRK 1.1	☐ DRK 1.3	☐ DRK 3.1	☐ DRK 3.3		
Voltage	☐ 24 V					
Braking Torque	☐ 8 ~ 480 Nm					
Mains Voltage	☐ 230 V AC	☐ 400 V AC				
Rectifier	☐ Power Supply			☐ Isolation Transformer		
Protection class	☐ IP 20					
Rotor Diameter	☐ Ø.....mm H7 DIN 6885 Standard					
Keyway Standard						
Armature Hub Diameter	☐ Ø.....mm H7 DIN 6885 Standard					
Keyway Standard						
Cable Length	☐ Standard (400 mm for All Sizes) ☐ pecial length : mm					
Pressure Flange	☐ Standard			☐ Heat Treated		
Ambient Temperature	☐ + °C					
Mounting Kit	☐ External Forced Axial Fan					
Other Features						

DRK 1.1 and DRK 1.3 : Clutch without bearing

DRK 1.1 and DRK 3.3 : Clutch with bearing