



Embragues Electromagnéticos Directos de Doble Flujo



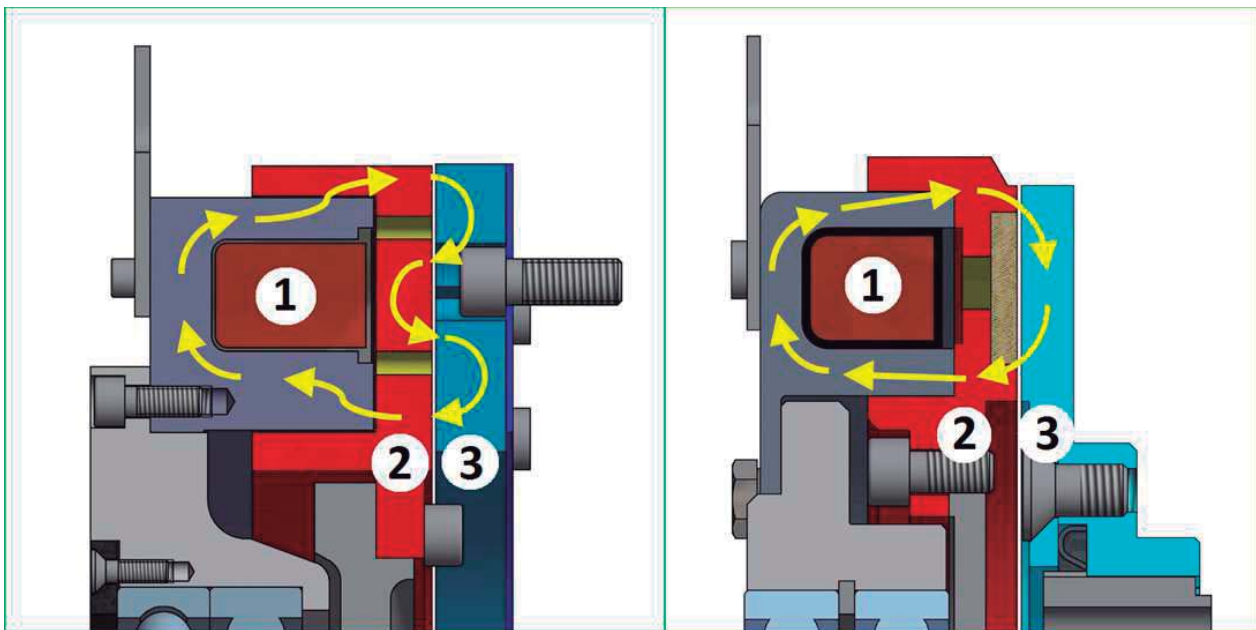
FOUR POLE FACE ELECTROMAGNETIC SINGLE-DISK CLUTCHES

08

GENERAL FEATURES

Four pole face friction clutches originate from the need to conjugate high transmittable torques with compact dimensions.

Their main feature is the magnetic flux crossing twice the rotor and armature, making possible a double use of the magnetic field force. In theory, this results in a transmittable torque two times higher with respect to a traditional electromagnetic clutch with the same dimensions.



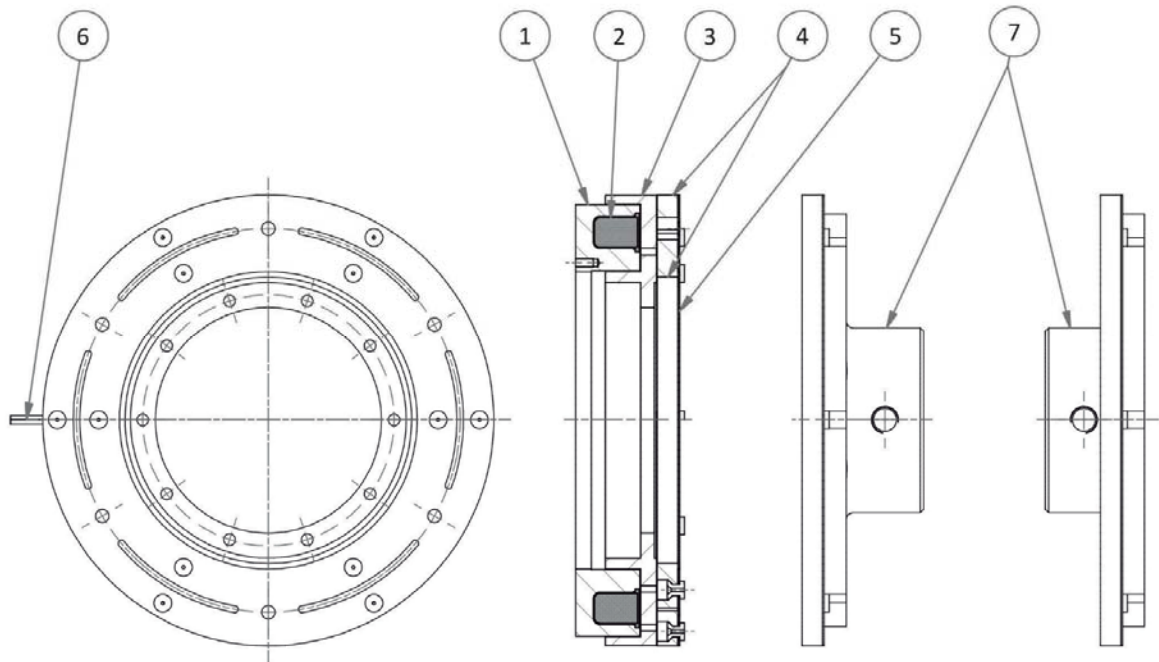
The pictures show sections taken from a traditional two pole-face clutch (on the right) and a new four pole-face clutch (on the left). Supplying a DC current, the coil (1) produce a magnetic field (displayed by the yellow arrows) which crosses rotor (2, red) and armature (3, cyan)

Suitable to an ample range of applications – from industrial and agricultural vehicles through mining and mechanical industry to marine applications – these clutches guarantee:

- *High transmittable torque due to magnetic field optimization*
- *Compact design and low inertia*
- *Large shaft diameters permitted*
- *No backlash*
- *No need of maintenance*
- *Reduced environmental influence on performances*
- *Long lifetime (due to ample contact surfaces and the surface hardening treatments applied to rotor and armature)*
- *High functioning speeds*
- *Very quiet functioning*
- *Safe functioning up to wear limit*
- *Zero drag-torque*
- *Low residual electromagnetic field*

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – B/B-ME, B-MI	EMSL/DF B	08
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EMSL/DF - B



PARTS LIST

1. COIL BODY
2. COIL
3. ROTOR
4. ARMATURE
5. FLAT SPRING
6. POWER CABLES
7. ADDITIONAL HUB (ME/MI)

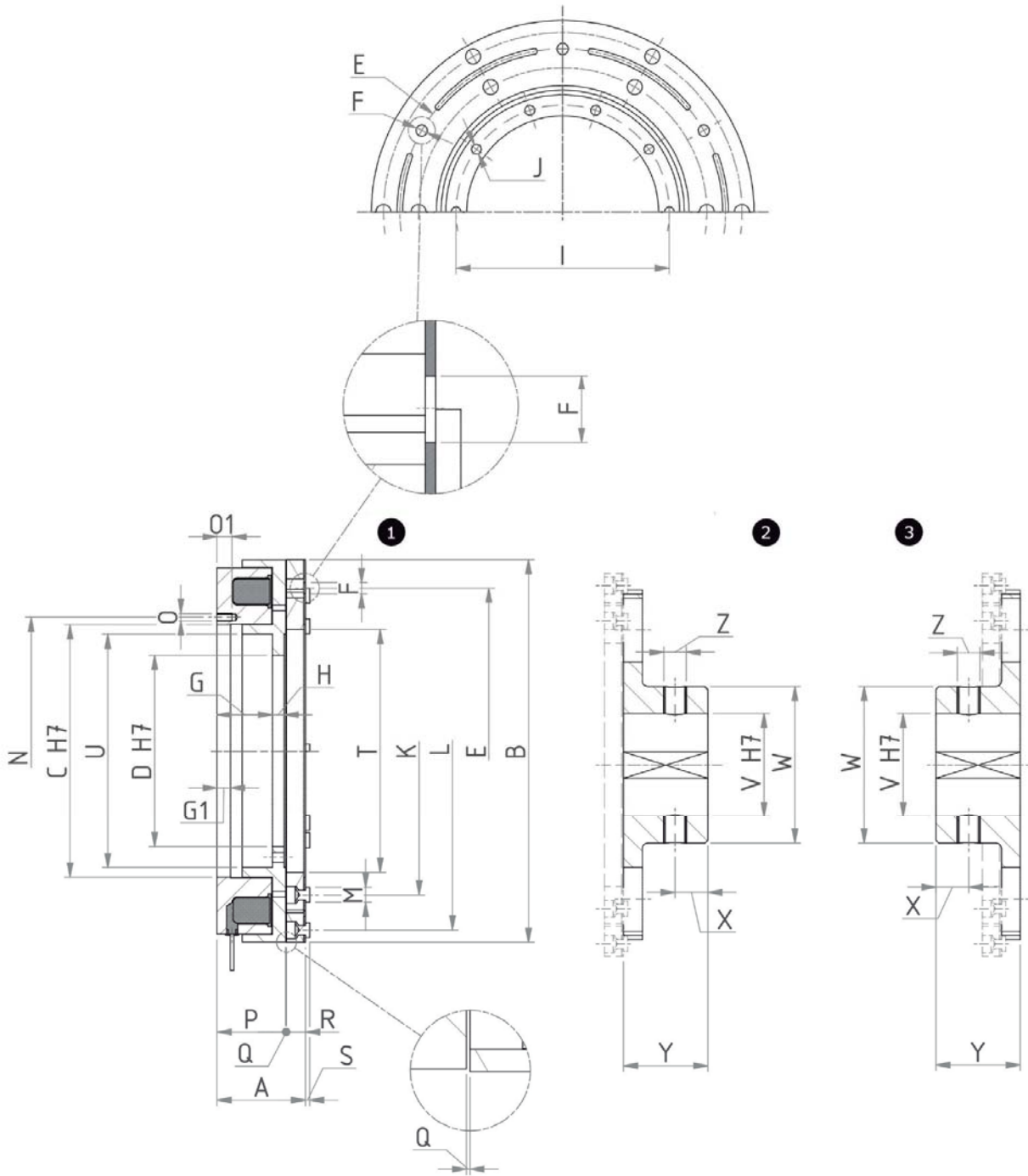
	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – B/B-ME, B-MI	EMSL/DF B	08
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MODEL
CODE

1	EMSL □□□/DF-B
	08.26.□□□.11

2	EMSL□□□/DF-B-ME
	08.26.□□□.12

3	EMSL □□□/DF-B-MI
	08.26.□□□.13



	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – B/B-ME, B-MI	EMSL/DF B	08
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DATASHEET

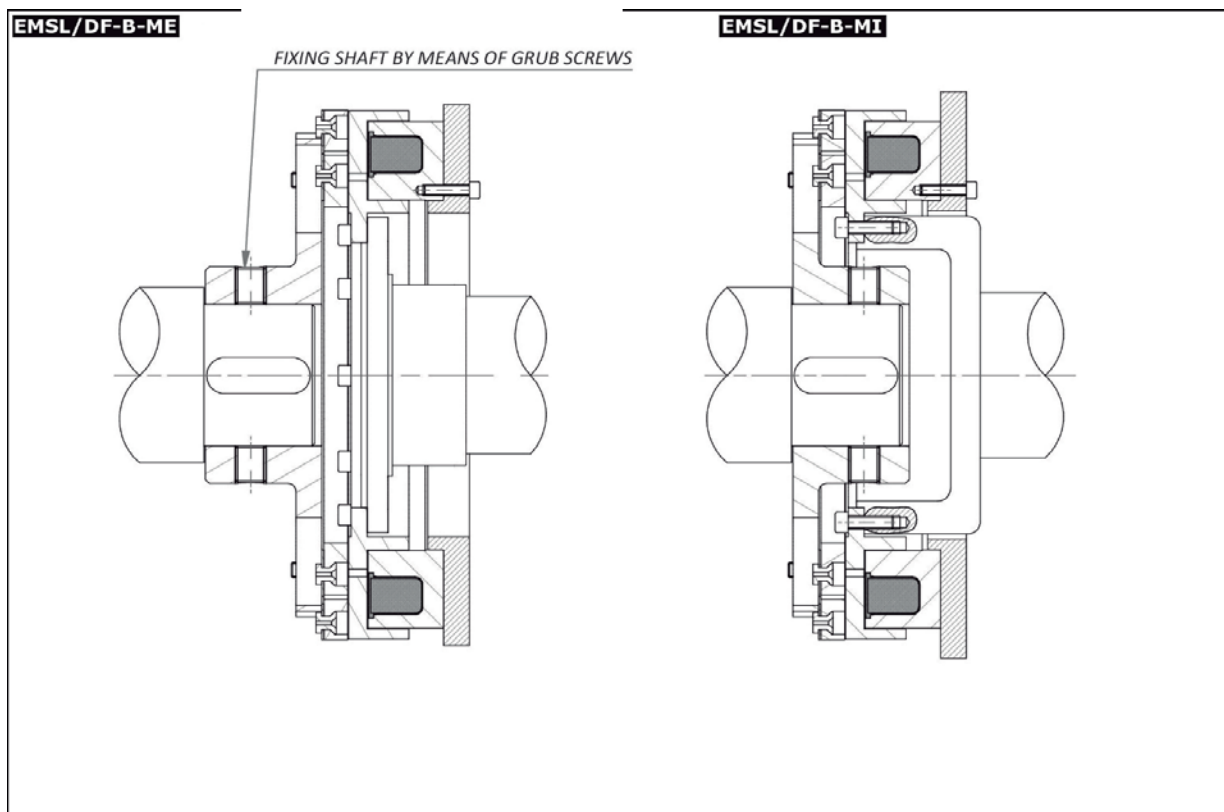
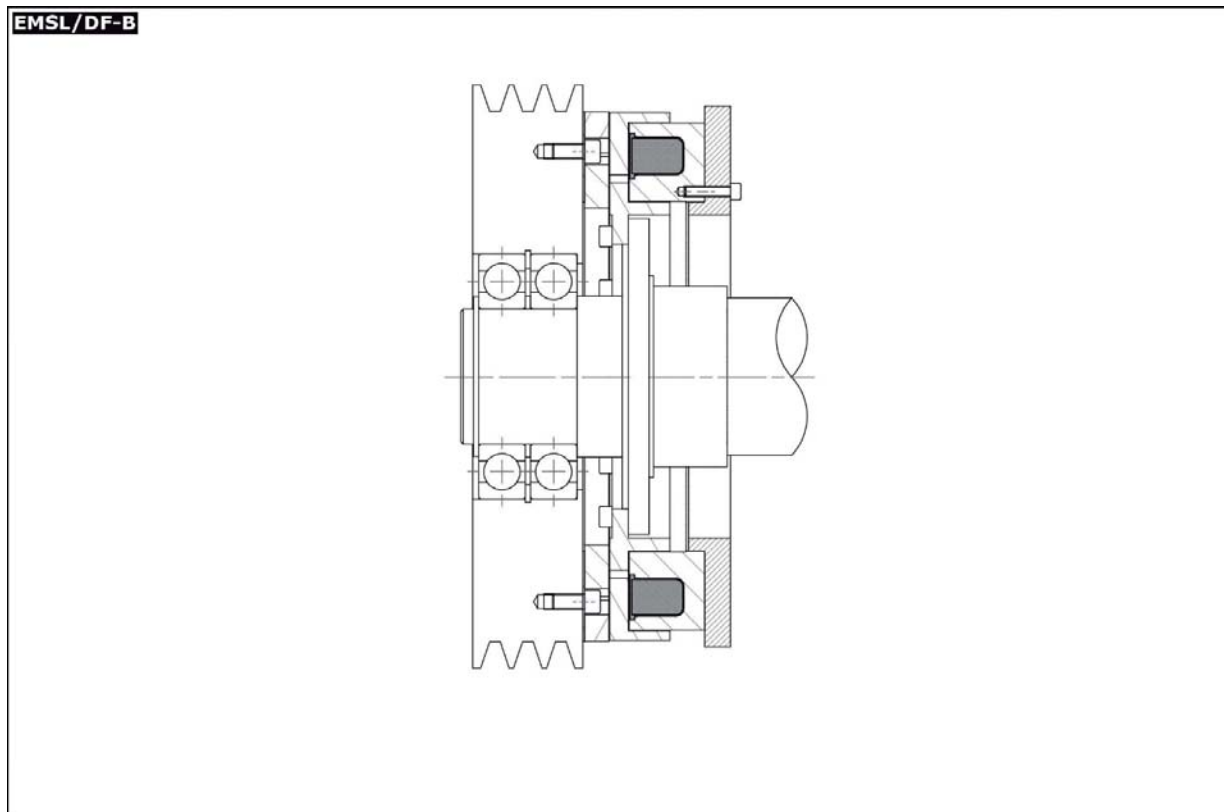
	170	210	260	310	400	500	600
Eng. Torque Mi (Nm)	160	350	570	1150	2300	3450	5100
Stat. Torque Ms (Nm)	250	550	900	1800	3600	5400	8000
Max. R.P.M.	5500	5000	4500	4000	3500	2800	2000
Build Up Time (ms)	182	286	363	473	616	715	800
Decay Time (ms)	83	132	180	242	330	385	400
Power (W)	65	85	120	240	280	440	576
Rot. side Inertia Jr (Kgm²)	0,0051	0,0155	0,0466	0,1157	0,3818	0,9894	2,1022
Arm. side Inertia Ja (Kgm²)	0,0046	0,0146	0,0321	0,0986	0,3348	0,8371	2,0002
Arm. side Inertia Ja (Kgm²)^a	0,0069	0,0186	0,0458	0,1655	0,5787	1,2735	3,3241
Weight (Kg)	4,61	7,78	12,86	23,56	94,14	87,19	145,27
Weight (Kg)^a	5,69	9,29	15,66	35,33	73,16	121,76	215,47
^a : ME/MI VARIANT, MASSIVE HUB							

SIZE TABLE

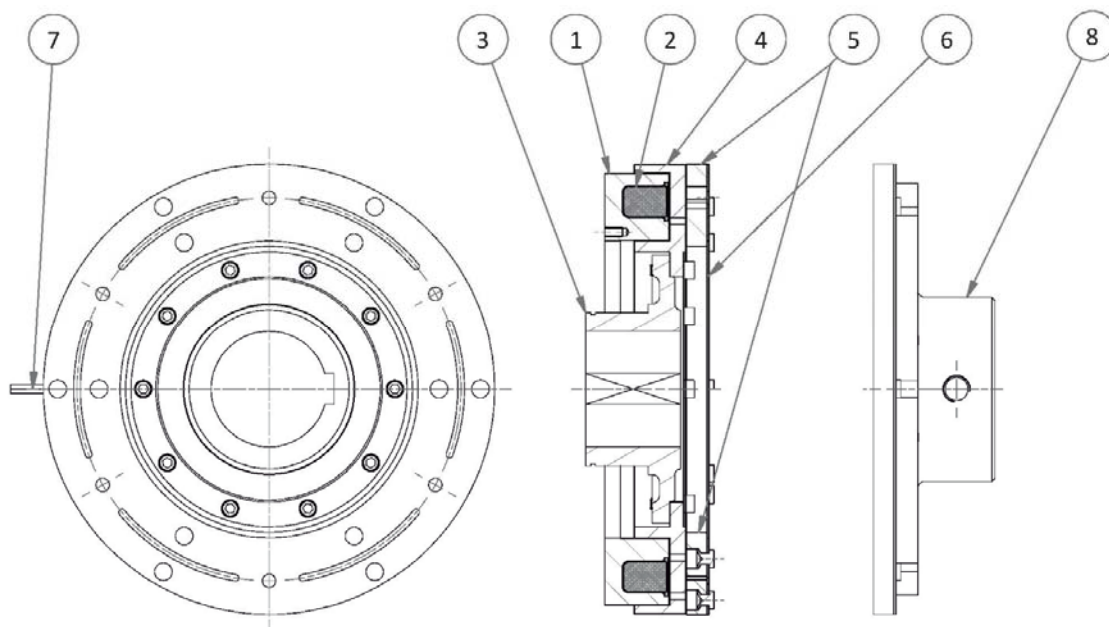
	170	210	260	310	400	500	600
A	54	57	60,5	74	94,2	111	137
B	169	216	266	327	409	497	606
C	110	144	180	222	270	325	400
D	80	110	138	170	205	250	336
E	140	172	217	275	348	410	515
F (N°xD)	3x6,1	4x8,1	6x8,1	6x10,1	6x12,1	8x12,1	8x16,1
G	36	37	39	46	59	69	92,2
G1	6	10	11	12	14,3	15	22
H	5,1	6	8,9	8	12,5	16	13,8
I	92	122	152	188	228	275	360
J (N°xD)	4x6,5	8x6,5	10x6,5	10x8,5	10x10,5	12x10,5	12x10,5
K	118	155	190	245	308	365	450
L	155	190	248	305	383	455	555
M (N°xD)	3x11	4x11	6x11	6x12	6x16	8x18	8x20
N	118	154	190	238	286	340	434
O (N°xD)	4xM5	6xM6	6xM6	6xM8	9xM8	9xM8	12xM10
O1 max.	12	13	13	20	16	16	25
P	44,1	45	48,9	58	73,5	87	109,2
Q	0,3	0,4	0,5	0,5	0,6	0,7	0,8
R	9,6	11,6	11,1	15,5	20,1	23,3	27
S	2	2	2	3	4,5	5	5
T	105	134	170	214	260	315	400
U	100	134	164	204	250	296	380
V max.	50	60	70	90	110	130	160
W	78	95	115	142	168	200	230
X	16	20	22	26	35	40	35/85
Y	45	55	55	70	90	100	150
Z (N°xD)	2xM10	2xM14	2xM16	2xM20	2xM24	2xM24	4xM24

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – B/B-ME, B-MI	EMSL/DF B	08
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MOUNTING EXAMPLES



EMSL/DF - BM



PARTS LIST

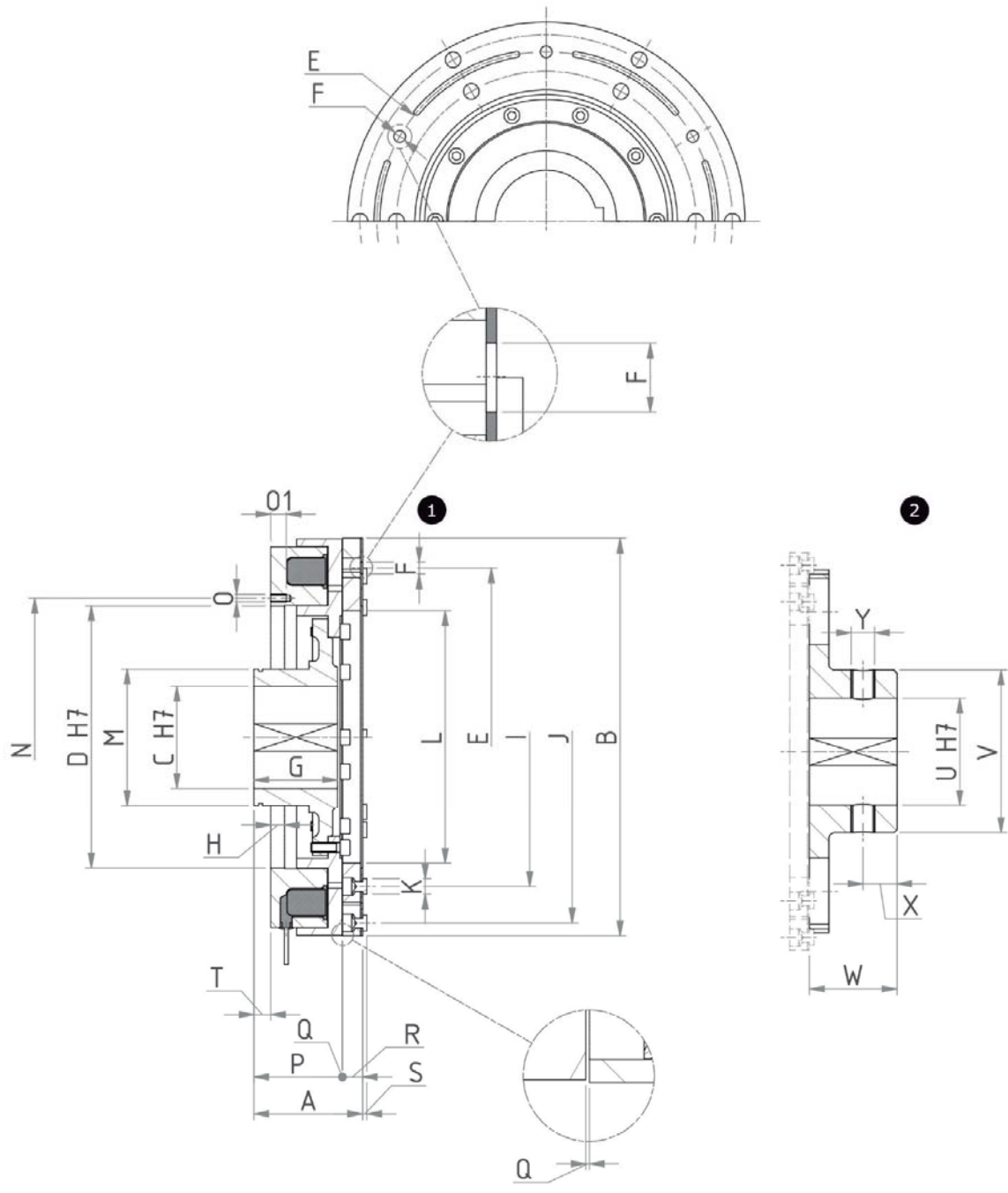
1. COIL BODY
2. COIL
3. ROTOR
4. ARMATURE
5. FLAT SPRING
6. POWER CABLES
7. ADDITIONAL HUB ME

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – BM/BM-ME	EMSL/DF	08
		BM	

MODEL
CODE

1	EMSL □□□/DF-BM
	08.26.□□□.21

2	EMSL □□□/DF-BM-ME
	08.26.□□□.22



	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – BM/BM-ME								EMSL/DF BM	08
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DATASHEET

	90	120	150	170	210	260	310	400	500	600
Eng. Torque Mi (Nm)	29	58	105	160	350	570	1150	2300	3450	5100
Stat. Torque Ms (Nm)	45	90	160	250	550	900	1800	3600	5400	8000
Max. R.P.M.	7000	6000	5600	5500	5000	4500	4000	3500	2800	2000
Build Up Time (ms)	75	100	138	182	286	363	473	616	715	800
Decay Time (ms)	35	46	66	83	132	180	242	330	385	400
Power (W)	35	50	56	65	85	120	240	280	440	576
Rot. side Inertia Jr (Kgm²)^a	0,0003	0,0013	0,0027	0,0063	0,0190	0,0546	0,1347	0,4492	1,1378	2,5800
Arm. side Inertia Ja (Kgm²)	0,0002	0,0011	0,0026	0,0046	0,0146	0,0321	0,0986	0,3348	0,8371	2,0002
Arm. side Inertia Ja (Kgm²)^b	0,0004	0,0017	0,0038	0,0069	0,0186	0,0458	0,1654	0,5787	1,2735	3,3241
Weight (Kg)^a	1,31	3,37	5,39	6,12	10,33	16,37	29,77	64,00	109,40	193,00
Weight (Kg)^b	1,57	3,90	6,15	7,20	11,85	19,17	41,54	87,84	143,81	262,97

^a: MASSIVE HUB - ^b: ME VARIANT, MASSIVE HUBS

SIZE TABLE

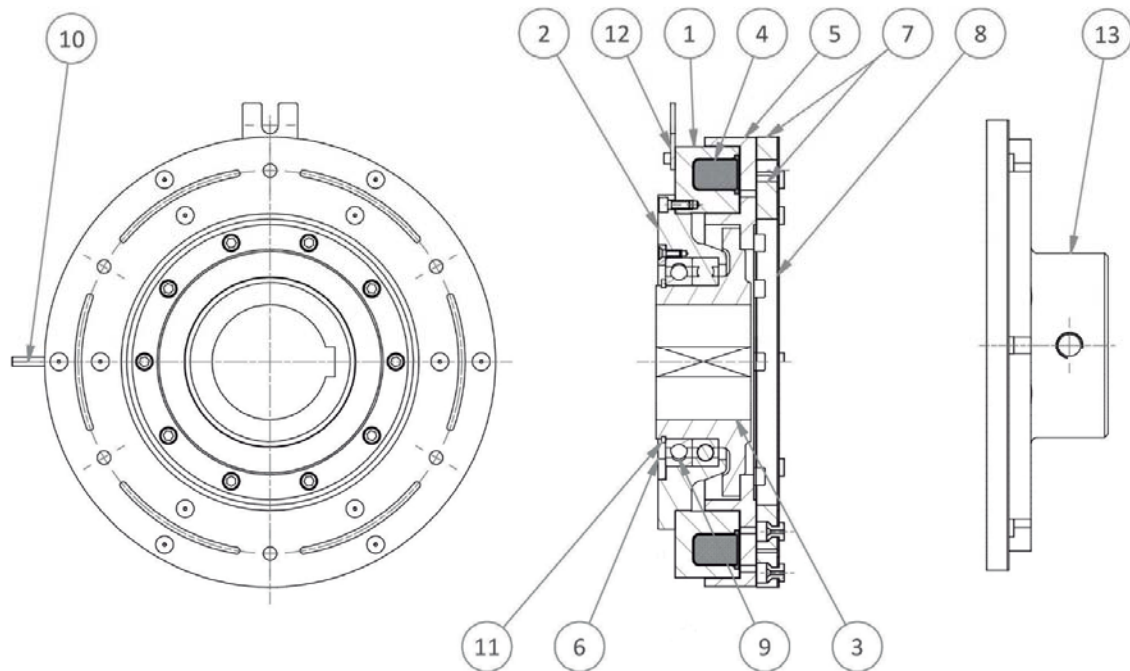
	90	120	150	170	210	260	310	400	500	600
A	38,5	50,5	58,5	65	69	69,5	86	111,5	128	180
B	90	124,5	149,5	169	216	266	327	409	497	606
C max.	26	38	44	44	55	65	85	105	120	150
D	47	65	72	110	144	180	222	270	325	400
E	68	96	118	140	172	217	275	348	410	515
F (N°xD)	3x5,1	3x6,1	3x8,1	3x6,1	4x8,1	6x8,1	6x10,1	6x12,1	8x12,1	8x16,1
G	32,5	43	50	52	55	56	66	86	97	149
H	3	4	5	6	10	11	12	14,3	15	22
I	55	70	102	118	155	190	245	308	365	450
J	80	111	135	155	190	248	305	383	455	555
K (N°xD)	3x7	3x10	3x10	3x11	4x11	6x11	6x12	6x16	8x18	8x20
L	42	58	74	105	134	170	214	260	315	400
M	35	50	55	55	70	80	105	140	160	190
N	55	77	85	118	154	190	238	286	340	434
O (N°xD)	3xM4	3xM6	3xM6	4xM5	6xM6	6xM6	6xM8	9xM8	9xM8	12xM10
O1 max.	8	12	12	12	13	13	20	16	16	25
P	32,5	43	50	55,1	57	57,9	70	90,8	104	152,2
Q	0,2	0,3	0,3	0,3	0,4	0,5	0,5	0,6	0,7	0,8
R	5,8	7,2	8,2	9,6	11,6	11,1	15,5	20,1	23,3	27
S	1,2	1,5	1,5	2	2	2	3	4,5	5	5
T	2,2	3,6	5,5	11	12	9	12	17,3	17	43
U max.	32	42	44	50	60	70	90	110	130	160
V	50	68	70	78	95	115	142	168	200	230
W	29,5	34,5	40	45	55	55	70	90	100	150
X	10	10	18	16	20	22	26	35	40	35/85
Y (N°xD)	2xM6	2xM8	2xM10	2xM10	2xM14	2xM16	2xM20	2xM24	2xM24	4xM24

FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – C/C-ME

EMSL/DF
C

08

EMSL/DF - C



PARTS LIST

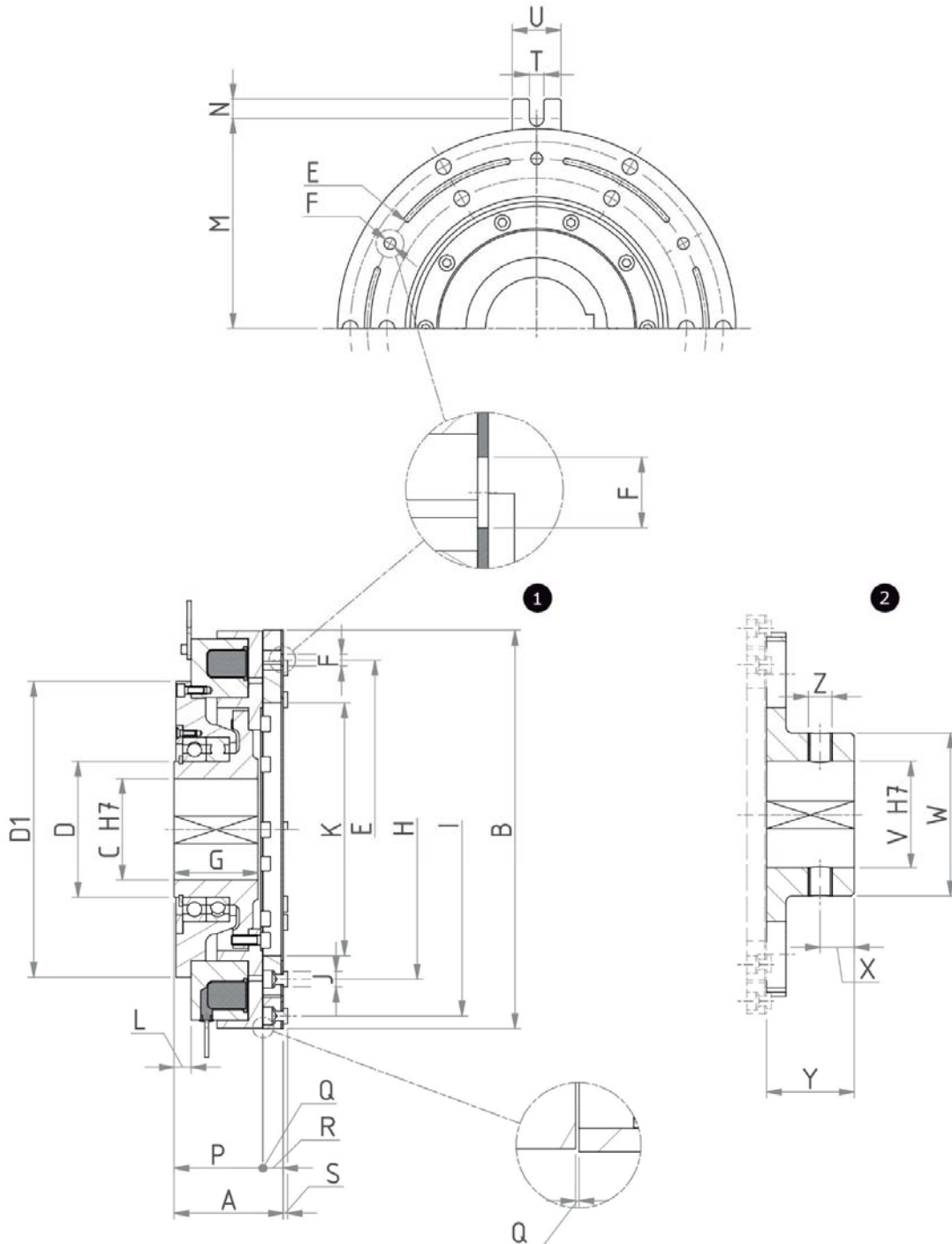
1. COIL BODY
2. COIL BODY SUPPORT RING
3. HUB
4. COIL
5. ROTOR
6. PLATE
7. ARMATURE
8. FLAT SPRING
9. COIL BODY BEARINGS
10. POWER CABLES
11. OUTER SAFETY RING
12. BRACKET
13. ADDITIONAL HUB ME

<i>FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – C/C-ME</i>	EMSL/DF c	08
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<i>MODEL</i>
<i>CODE</i>

1	EMSL □□□/DF-C
	08.26.□□□.31

2	EMSL □□□/DF-C-ME
	08.26.□□□.32



	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – C/C-ME								EMSL/DF C	08
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DATASHEET

	90	120	150	170	210	260	310	400	500	600
Eng. Torque Mi (Nm)	29	58	105	160	350	570	1150	2300	3450	5100
Stat. Torque Ms (Nm)	45	90	160	250	550	900	1800	3600	5400	8000
Max. R.P.M.	6000	4500	4250	4000	3000	2800	2200	1600	1400	1200
Build Up Time (ms)	75	100	138	182	286	363	473	616	715	800
Decay Time (ms)	35	46	66	83	132	180	242	330	385	400
Power (W)	35	50	56	65	85	120	240	280	440	576
Rot. side Inertia Jr (Kgm²)^a	0,0003	0,0013	0,0029	0,0064	0,0196	0,0555	0,1382	0,4608	1,1625	2,6304
Arm. side Inertia Ja (Kgm²)	0,0002	0,0011	0,0026	0,0046	0,0146	0,0321	0,0986	0,3348	0,8371	2,0002
Arm. side Inertia Ja (Kgm²)^b	0,0004	0,0017	0,0038	0,0069	0,0186	0,0458	0,1654	0,5787	1,2735	3,3241
Weight (Kg)^a	1,39	3,56	5,68	7,00	12,00	18,52	34,00	71,60	121,50	219,10
Weight (Kg)^b	1,64	4,10	6,44	8,10	13,55	21,32	45,71	95,48	155,56	289,10

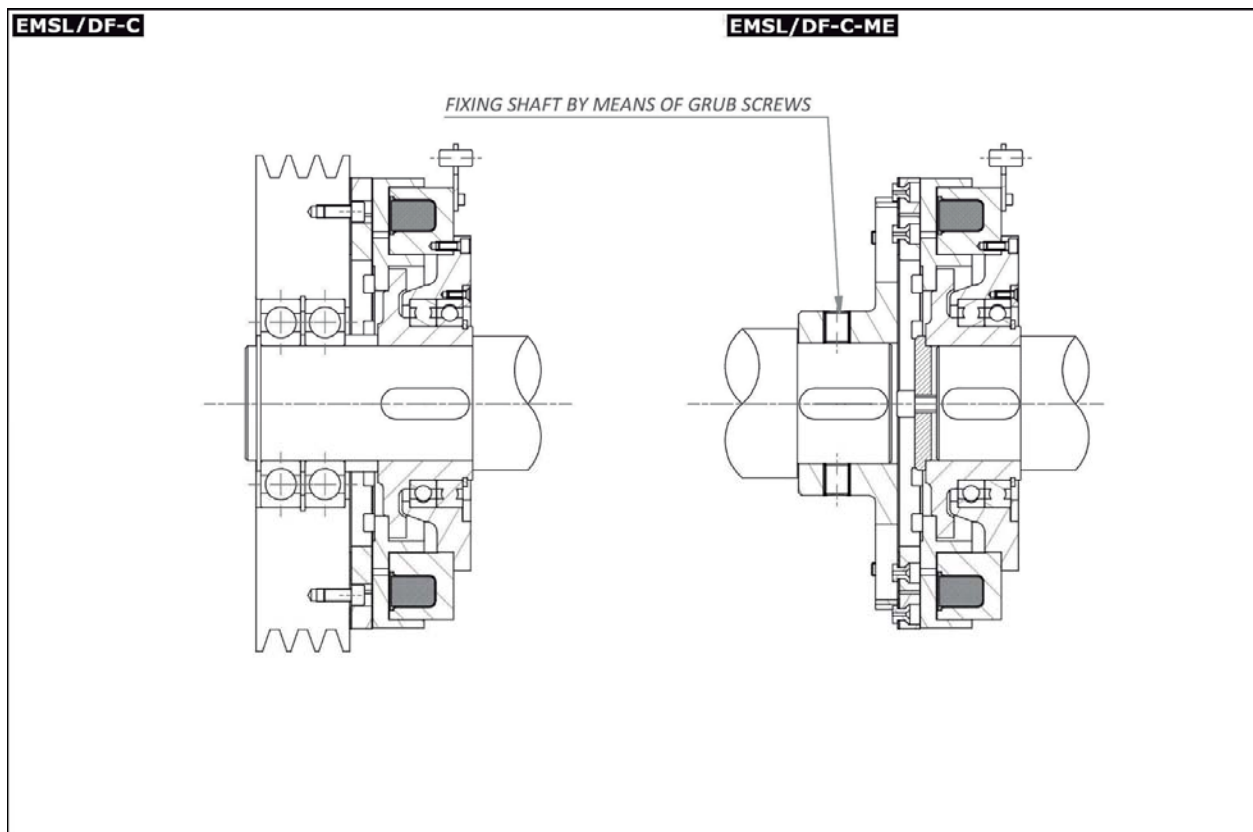
^a: MASSIVE HUB - ^b: ME VARIANT, MASSIVE HUBS

SIZE TABLE

	90	120	150	170	210	260	310	400	500	600
A	38,5	50,5	58,5	65	69	69,5	86	111,5	128	180
B	90	124,5	149,5	169	216	266	327	409	497	606
C max.	26	38	44	44	55	65	85	105	120	150
D	35	50	55	55	70	80	105	140	160	190
D1	--	--	--	130	168	206	258	304	358	458
E	68	96	118	140	172	217	275	348	410	515
F (N°xD)	3x5,1	3x6,1	3x8,1	3x6,1	4x8,1	6x8,1	6x10,1	6x12,1	8x12,1	8x16,1
G	32,5	43	50	52	55	56	66	86	97	149
H	55	70	102	118	155	190	245	308	365	450
I	80	111	135	155	190	248	305	383	455	555
J (N°xD)	3x7	3x10	3x10	3x11	4x11	6x11	6x12	6x16	8x18	8x20
K	42	58	74	105	134	170	214	260	315	400
L	2,2	3,6	5,5	11	12	9	12	17,3	17	43
M	51	65	78	91	125	150	180	215	260	315
N	7	7	7	10	10	10	10	20	20	25
P	32,5	43	50	55,1	57	57,9	70	90,8	104	152,2
Q	0,2	0,3	0,3	0,3	0,4	0,5	0,5	0,6	0,7	0,8
R	5,8	7,2	8,2	9,6	11,6	11,1	15,5	20,1	23,3	27
S	1,2	1,5	1,5	2	2	2	3	4,5	5	5
T	5,5	5,5	5,5	8	10	10	10	15	15	20
U	19	19	19	23	25	25	25	50	50	60
V max.	32	42	44	50	60	70	90	110	130	160
W	50	68	70	78	95	115	142	168	200	230
X	10	10	18	16	20	22	26	35	40	35/85
Y	29,5	34,5	40	45	55	55	70	90	100	150
Z (N°xD)	2xM6	2xM8	2xM10	2xM10	2xM14	2xM16	2xM20	2xM24	2xM24	4xM24

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – C/C-ME	EMSL/DF c	08
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MOUNTING EXAMPLES

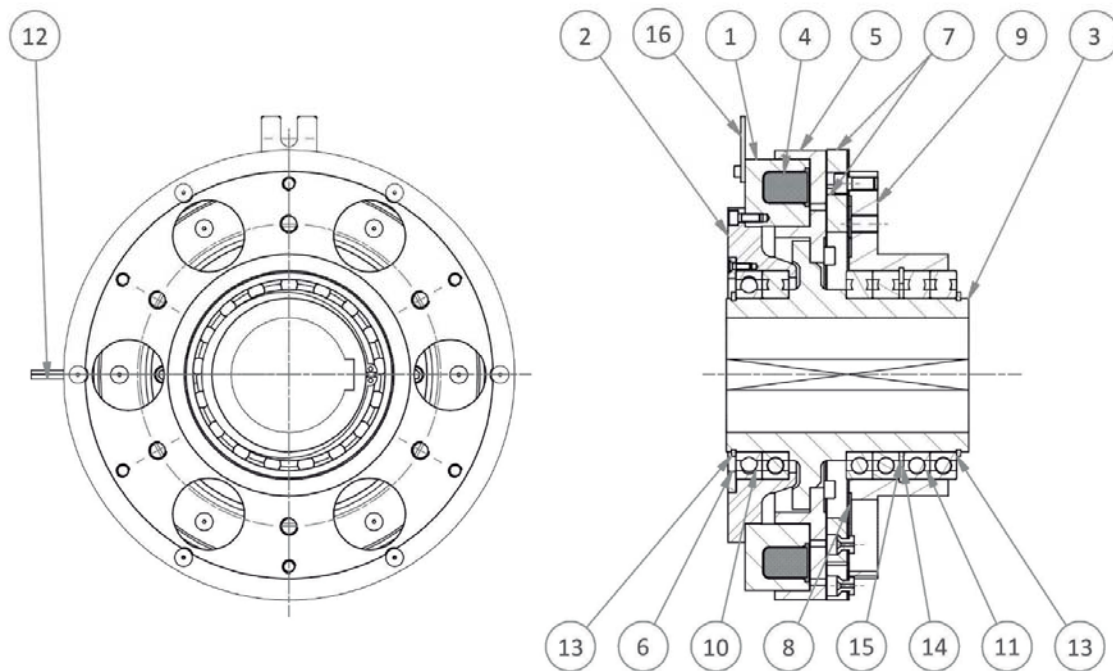


FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – R

EMSL/DF
R

08

EMSL/DF - R

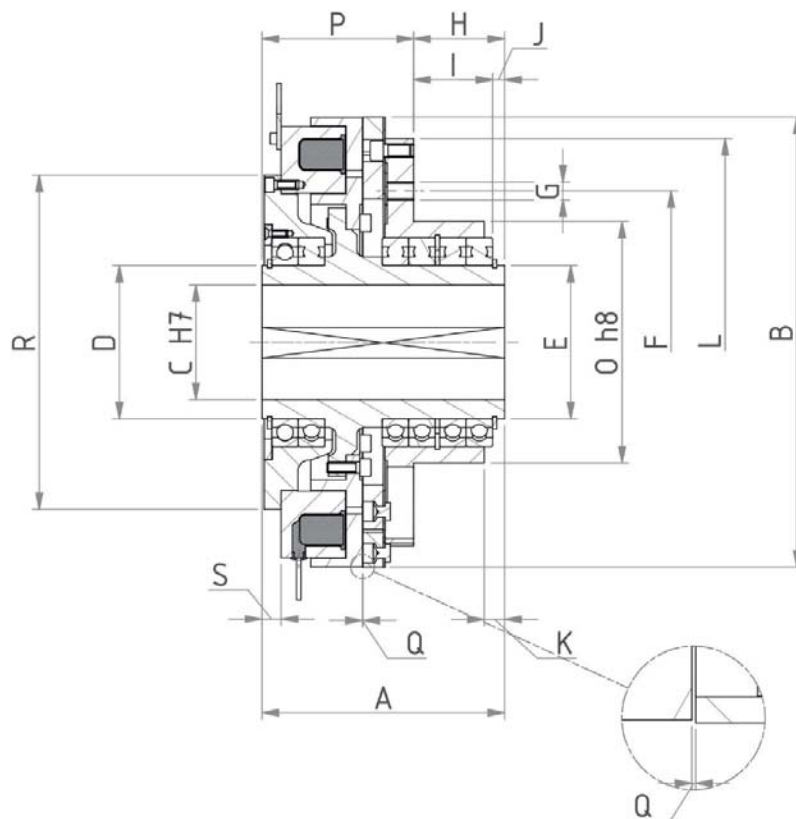
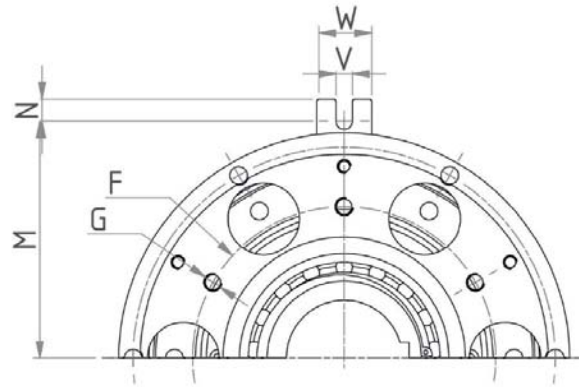


PARTS LIST

- 1. COIL BODY**
- 2. COIL BODY SUPPORT RING**
- 3. HUB**
- 4. COIL**
- 5. ROTOR**
- 6. PLATE**
- 7. ARMATURE**
- 8. FLAT SPRING**
- 9. SLEEVE**
- 10. COIL BODY BEARINGS**
- 11. SLEEVE BEARINGS**
- 12. POWER CABLES**
- 13. INNER SAFETY RING**
- 14. OUTER SAFETY RING**
- 15. SPACER RING**
- 16. BRACKET**

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – R	EMSL/DF R	08
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MODEL	EMSL □□□/DF-R
CODE	08.26.□□□.41



	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – R								EMSL/DF R	08
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DATASHEET

	90	120	150	170	210	260	310	400	500	600
Eng. Torque Mi (Nm)	29	58	105	160	350	570	1150	2300	3450	5100
Stat. Torque Ms (Nm)	45	90	160	250	550	900	1800	3600	5400	8000
Max. R.P.M.	6000	4500	4250	4000	3000	2800	2200	1600	1400	1200
Build Up Time (ms)	75	100	138	182	286	363	473	616	715	800
Decay Time (ms)	35	46	66	83	132	180	242	330	385	400
Power (W)	35	50	56	65	85	120	240	280	440	576
Rot. side Inertia Jr (Kgm²)^a	0,0004	0,0017	0,0034	0,0076	0,0235	0,639	0,1620	0,5322	1,2762	3,0425
Arm. side Inertia Ja (Kgm²)	0,0003	0,0016	0,0038	0,0109	0,0358	0,0795	0,2187	0,6617	1,4318	3,7486
Weight (Kg)^a	1,83	4,70	7,27	10,56	20,31	31,41	56,51	112,21	177,57	342,61

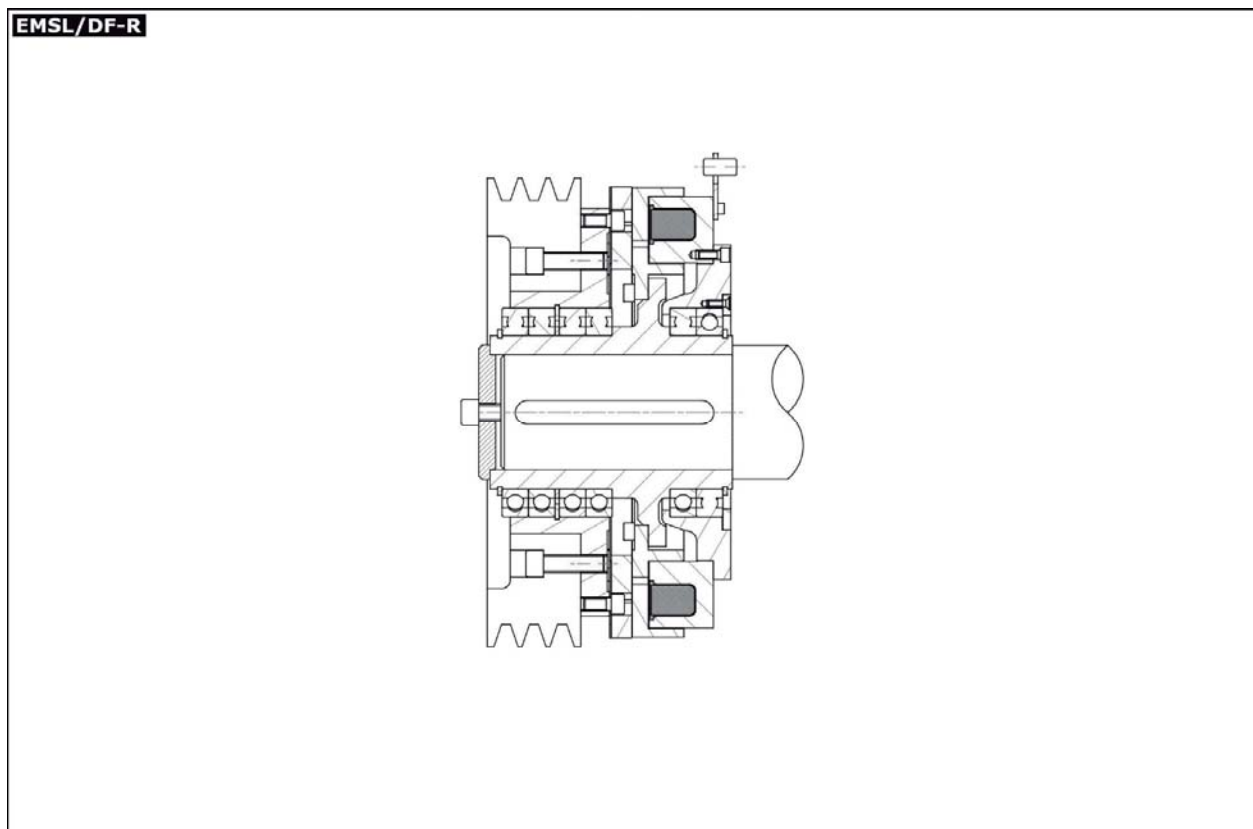
^a: MASSIVE HUB

SIZE TABLE

	90	120	150	170	210	260	310	400	500	600
A	67	88	96	112	142	150	180	220	258	377
B	90	124,5	149,5	169	216	266	327	409	497	606
C max.	26	38	44	44	55	65	85	105	115	150
D	35	50	55	55	70	80	105	140	160	190
E	35	50	55	55	70	80	105	140	150	190
F	68	91	110	130	160	180	220	275	300	360
G (N°xD)	3xM5	3xM6	6xM6	3xM8	4xM8	6xM8	6xM12	6xM16	8xM16	8xM20
H	18,5	25,5	24,3	34	55	64,5	73	82,5	102	162
I	14,35	20,7	19	28	47	55	63	71,5	90	151
J	4,15	4,8	5,5	6	8	9,5	10	11	12	11
K	5	6	5,3	9	9	10,5	16	18,5	18	21
L	77	105	129	154	188	235	295	370	435	540
M	51	65	78	91	125	150	180	215	260	315
N	7	7	7	10	10	10	10	20	20	25
O	55	75	82	102	125	150	185	220	240	300
P	48,5	62,5	71,7	78	87	85,5	107	137,5	156	215
Q	0,2	0,3	0,3	0,3	0,4	0,5	0,5	0,6	0,7	0,8
R	--	--	--	130	168	206	258	304	358	458
S	2,2	3,6	5,7	11	12	9	12	17,3	17	43
V	5,5	5,5	5,5	8	10	10	10	15	15	20
W	19	19	19	23	25	25	25	50	50	60

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – R	EMSL/DF R	08
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MOUNTING EXAMPLES

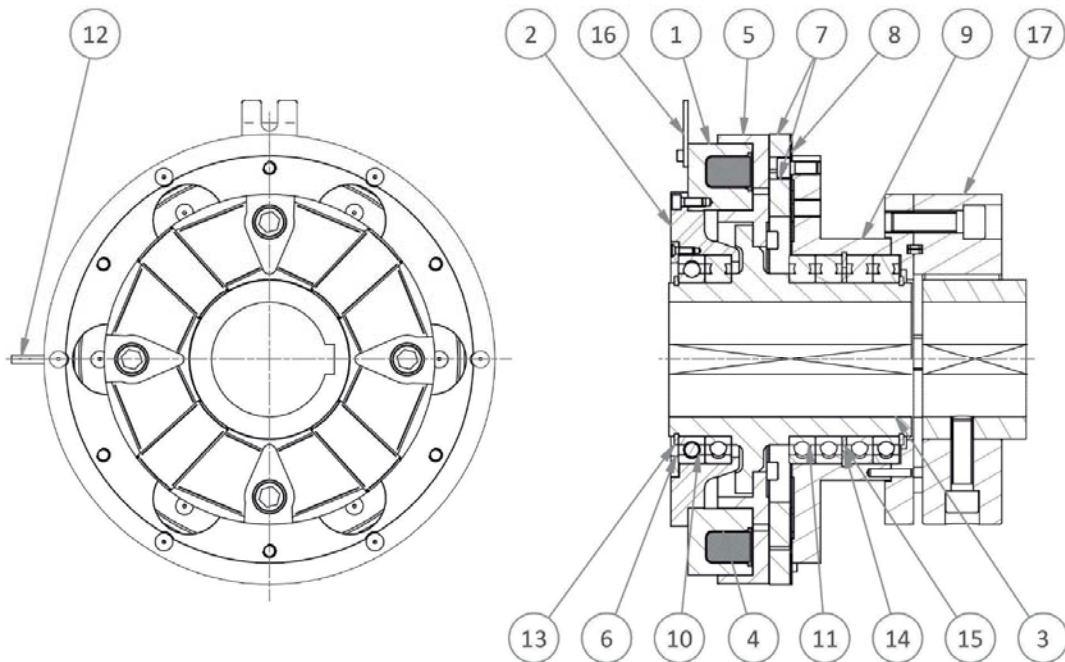


FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – GE

EMSL/DF
GE

08

EMSL/DF - GE



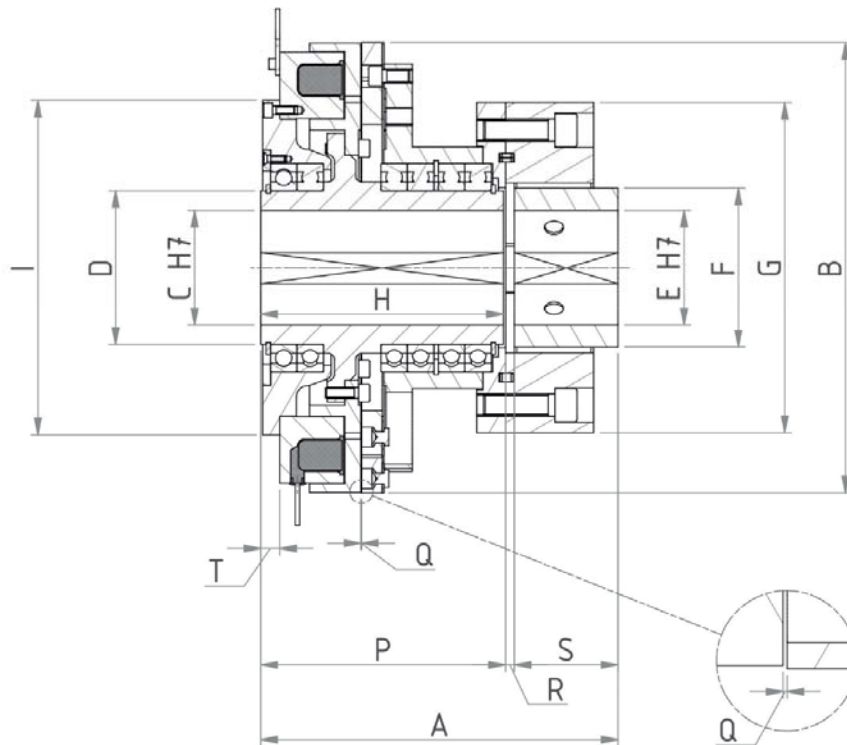
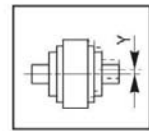
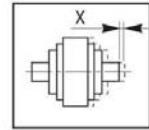
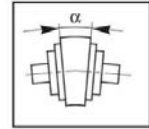
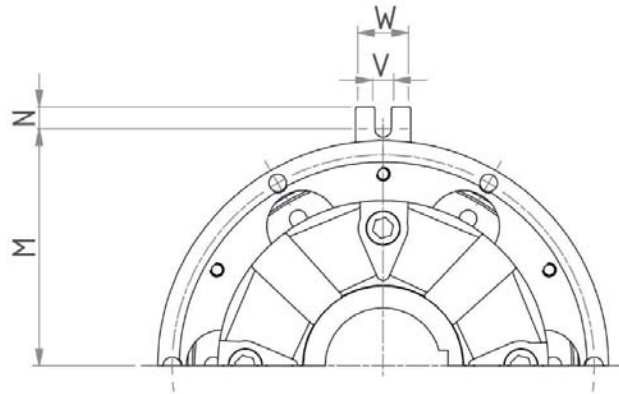
PARTS LIST

1. COIL BODY
2. COIL BODY SUPPORT RING
3. HUB
4. COIL
5. ROTOR
6. PLATE
7. ARMATURE
8. FLAT SPRING
9. SLEEVE
10. COIL BODY BEARINGS
11. SLEEVE BEARINGS
12. POWER CABLES
13. INNER SAFETY RING
14. OUTER SAFETY RING
15. SPACER RING
16. BRACKET
17. FLEXIBLE COUPLING

	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – GE	EMSL/DF GE	08
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MODEL
CODE

EMSL □□□/DF-GE
08.26.□□□.51



	FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – GE								EMSL/DF GE	08
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DATASHEET

	90	120	150	170	210	260	310	400	500	600
Eng. Torque Mi (Nm)	29	58	105	160	350	570	1150	2300	3450	5100
Stat. Torque Ms (Nm)	45	90	160	250	550	900	1800	3600	5400	8000
Max. R.P.M.	6000	4500	4250	4000	3000	2800	2200	1600	1400	1200
Build Up Time (ms)	75	100	138	182	286	363	473	616	715	800
Decay Time (ms)	35	46	66	83	132	180	242	330	385	400
Power (W)	35	50	56	65	85	120	240	280	440	576
Coupling size	2	4	8	12	25	30	90	200	250	400
Rot. side Inertia Jr (Kgm²)^a	0,0004	0,0017	0,0034	0,0076	0,0235	0,639	0,1620	0,5322	1,2762	3,0425
Arm. side Inertia Ja (Kgm²)^a	0,0008	0,0023	0,0056	0,0093	0,0341	0,0793	0,3518	0,9143	1,8262	4,4761
Weight (Kg)^a	2,35	5,36	8,50	10,90	21,30	33,63	71,84	133,74	205,00	383,74

^a: MASSIVE HUBS

SIZE TABLE

	90	120	150	170	210	260	310	400	500	600
A	99	124	142	158	203	224	270	324	370	515
B	90	124,5	149,5	169	216	266	327	409	497	606
C max.	26	38	44	44	55	65	85	105	115	150
D	35	50	55	55	70	80	105	140	160	190
E max.	26	30	38	38	55	65	85	105	115	120
F	40	45	60	60	85	100	125	145	160	170
G	85	100	120	122	170	200	260	300	340	370
H	67	88	96	112	142	150	180	220	258	377
I	--	--	--	130	168	206	258	304	358	458
M	51	65	78	91	125	150	180	215	260	315
N	7	7	7	10	10	10	10	20	20	25
P	67	90	96	112	142	150	182	222	262	380
Q	0,2	0,3	0,3	0,3	0,4	0,5	0,5	0,6	0,7	0,8
R	4	4	4	4	6	8	8	8	8	10
S	28	30	42	42	55	66	80	94	100	125
T	2,2	3,6	5,7	11	12	9	12	17,3	17	43
V	5,5	5,5	5,5	8	10	10	10	15	15	20
W	19	19	19	23	25	25	25	50	50	60
X	2	2	2	2	3	3	3	3	3	3
Y	1	1	1	1	1	1	1	1	1	1
α	1°	1°	1°	1°	1°	1°	1°	1°	1°	1°

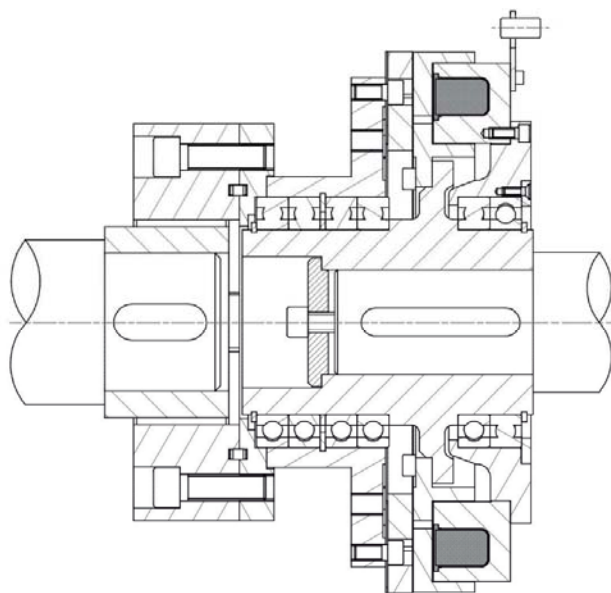
FOUR POLE FACE ELECTROMAGNETIC FRICTION CLUTCHES – GE

EMSL/DF
GE

08


MOUNTING EXAMPLES

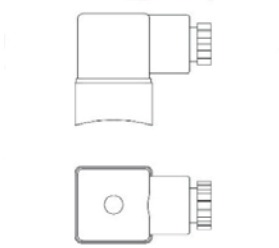
EMSL/DF-GE

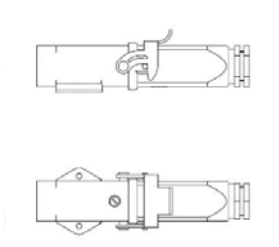


	ACCESSORIES	EMSL/DF EMFL/DF	08
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CONNECTORS ON DEMAND

	<p>Sui modelli 090-120-150-170-210 On models 090-120-150-170-210</p>
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	<p>Sui modelli 260-310 On models 260-310</p>
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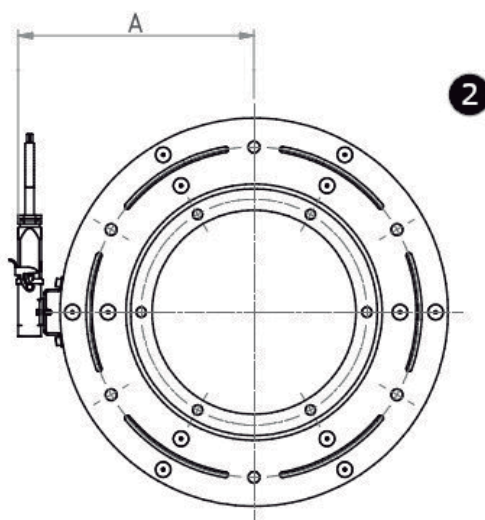
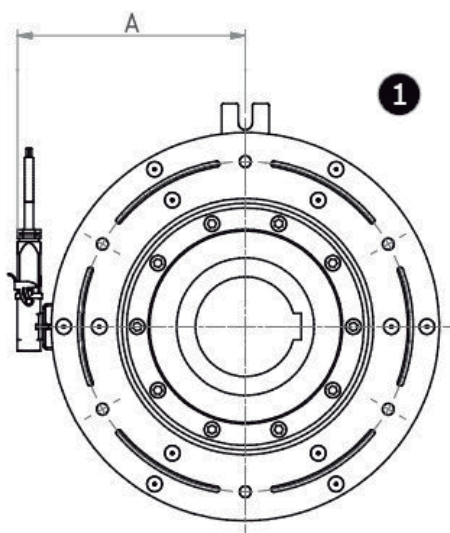
	<p>Sui modelli 400-500-600 On models 400-500-600</p>
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	<i>ACCESSORIES</i>	EMSL/DF EMFL/DF	08
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<i>MODEL</i>
<i>CODE</i>

1	EMSL □□□/DF
	08.26.□□□.xx

2	EMFL □□□/DF
	08.28.□□□.xx

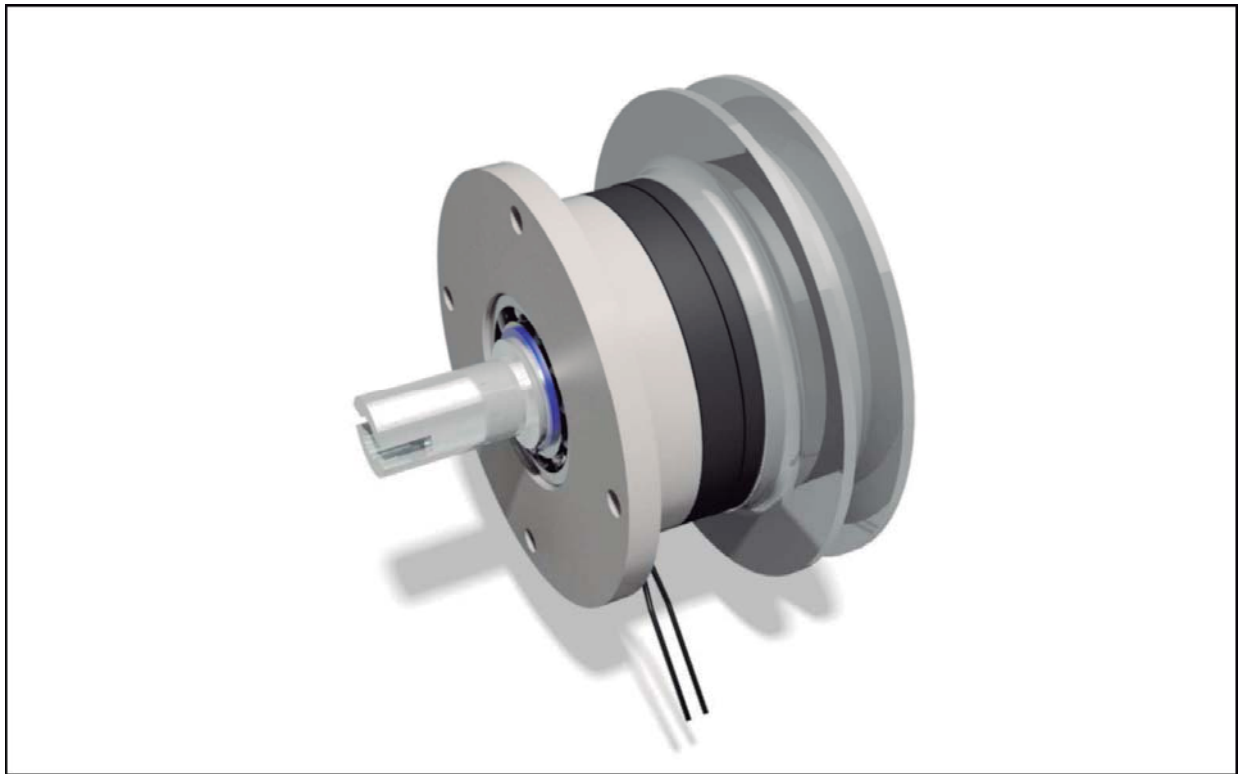


<i>CONNECTOR SIZE</i>	<i>A</i>									
	90	120	150	170	210	260	310	400	500	600
EMSL/DF	61	78	90	99	122	181	211	240	285	341
EMFL/DF	65	82	93	106	129	188	218	249	293	349

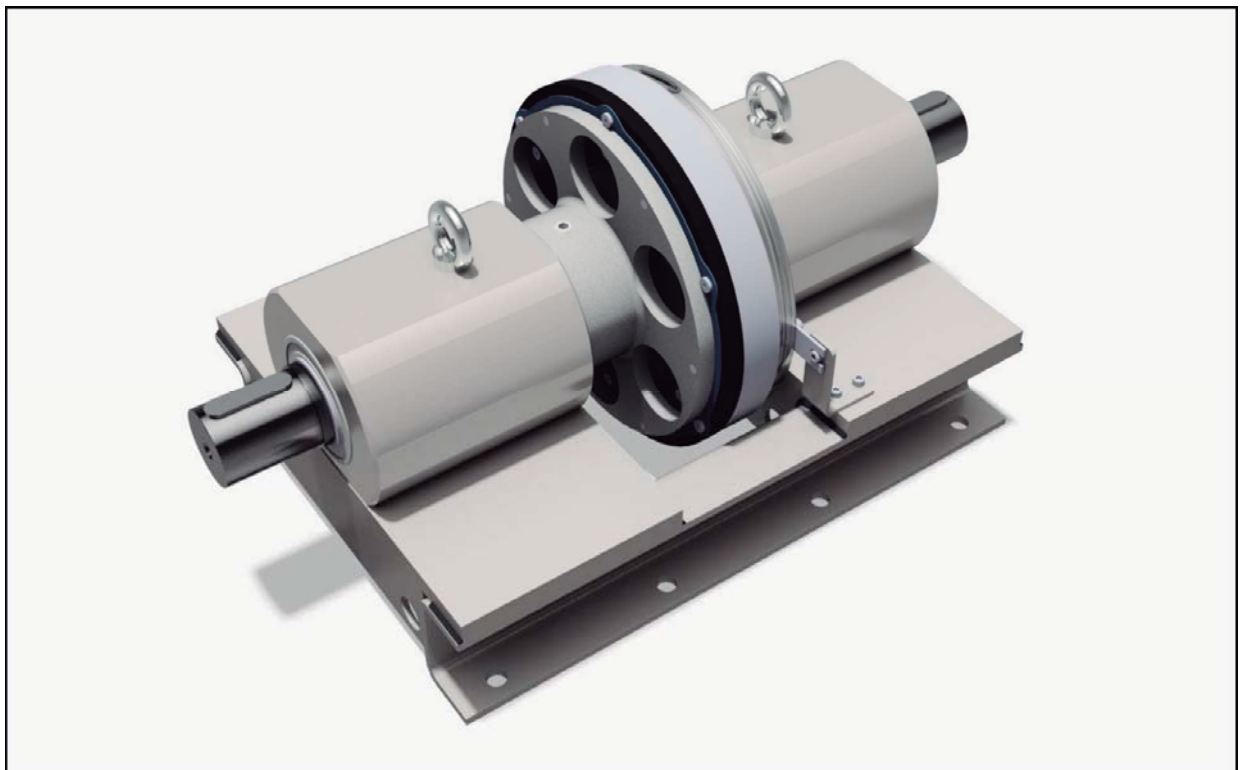
CUSTOMIZED SPECIAL PRODUCTS

EMSL/DF
EMFL/DF

08



ELECTROMAGNETIC FOUR POLE FACE CLUTCH WITH PULLEY AND SHAFT



POWER TAKE-OFF SHAFT-SHAFT ON WELDED FRAME, WITH ELECTROMAGNETIC FOUR POLE FACE CLUTCH