

# TCD 2013



TST CO.

www.TST-CO.com

90 - 260 kW | 121 - 349 hp at 1500/1800 min<sup>-1</sup> | rpm  
EU Stage IIIA / US EPA Tier 3

for power generating sets

- Watercooled 4 or 6-cylinder inline engines with turbocharging and charge air cooling.
- The powerful DEUTZ Common Rail (DCR<sup>®</sup>) injection system and the electronic engine control (EMR 4) with intelligent link to the drive management ensure optimum engine performance at low fuel consumption.
- Easy, inexpensive installation due to minimum weight and small installation space.



- Air filter and cooling system are fully pre-assembled.

- Low noise emissions due to acoustically optimized components with very smooth running and high durability.
- Wet cylinder liners, long oil change intervals and easy changing of the engine fluids reduce the running costs and increase the availability of the machinery.
- Best cold starting performance even under extreme conditions.
- The TCD 2013 meets the requirements of the EU Stage IIIA and US EPA Tier 3.

## Technical data

Engine type		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
No. of cylinders		4	6	6
Bore/stroke	mm   in	108/130   4.3/5.1	108/130   4.3/5.1	108/130   4.3/5.1
Displacement	l   cu in	4.8   293	7.2   439	7.2   439
Weight with cooling system and air filter	kg   lb	660   1455	945   2083	955   2105
Governing standard <sup>1)</sup>		G2	G3	G3

## 50 Hz / 1500 min<sup>-1</sup>

Power		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
Continuous Power (COP) <sup>2)</sup>	kW   hp	90   121	136   182	226   303
Prime Power (PRP) <sup>3)</sup>	kW   hp	95   128	144   192	238   319
Limited Time Power (LTP) <sup>4)</sup>	kW   hp	100   135	151   202	251   336
Fan power consumption	kW   hp	2.6   3	5.0   7	9.2   12
Typical Generator Output COP <sup>5)</sup>	kVA	99	151	249
Typical Generator Output PRP <sup>5)</sup>	kVA	104	159	263
Typical Generator Output LTP <sup>5)</sup>	kVA	110	168	278

## 60 Hz / 1800 min<sup>-1</sup>

Power output		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
Continuous Power (COP) <sup>2)</sup>	kW   hp	103   138	156   209	234   314
Prime Power (PRP) <sup>3)</sup>	kW   hp	109   146	165   221	247   332
Limited Time Power (LTP) <sup>4)</sup>	kW   hp	114   153	174   233	260   349
Fan power consumption	kW   hp	4.4   6	8.7   12	15.8   21
Typical Generator Output COP <sup>5)</sup>	kWe	89	136	201
Typical Generator Output PRP <sup>5)</sup>	kWe	94	144	213
Typical Generator Output LTP <sup>5)</sup>	kWe	99	152	225

1) According to ISO 8528-5.

2) Continuous Power: No time limitation, plus 10% additional power for governing purpose only.

3) Prime Power: Average power output ≤ 80%, no time limitation, plus 5% additional power for governing purpose only.

4) Limited Time Running Power: For up to 500 h/year, thereof a maximum of 300 h/year continuous running.

5) In consideration of a generator efficiency level of 90 - 92 % and a power factor of 0.8.

## 50 Hz / 1500 min<sup>-1</sup>

Fuel Consumption (PRP) <sup>6)</sup>		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
Fuel consumption 25% load	g/kWh   lb/hph	318   0.52	260   0.43	253   0.42
Fuel consumption 50% load	g/kWh   lb/hph	284   0.47	249   0.41	235   0.39
Fuel consumption 75% load	g/kWh   lb/hph	270   0.44	236   0.39	225   0.37
Fuel consumption 100% load	g/kWh   lb/hph	244   0.40	216   0.36	210   0.35

Heat balance & cooling system		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
Heat dissipation (engine radiator) <sup>2)</sup>	kW   hp	50   67	74   99	133   178
Heat dissipation (CAC) <sup>2)</sup>	kW   hp	19   25	23   31	39   52
Heat dissipation (convection)	kW   hp	9   12	14   19	23   31
Cooling air flow	m <sup>3</sup> /h   cfm	6480   3814	11500   6769	15480   9111

Inlet & exhaust data		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
max. intake depression	mbar   psi	10   0.15	10   0.15	10   0.15
Combustion air volume	m <sup>3</sup> /h   cfm	450   265	600   353	756   445
max. exhaust gas temperature	°C   °F	530   986	485   905	515   959
Exhaust gas flow	m <sup>3</sup> /h   cfm	1261   742	1587   934	2079   1224

## 60 Hz / 1800 min<sup>-1</sup>

Fuel Consumption (PRP) <sup>6)</sup>		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
Fuel consumption 25% load	g/kWh   lb/hph	318   0.52	288   0.47	255   0.42
Fuel consumption 50% load	g/kWh   lb/hph	282   0.46	260   0.43	234   0.38
Fuel consumption 75% load	g/kWh   lb/hph	263   0.43	243   0.40	245   0.40
Fuel consumption 100% load	g/kWh   lb/hph	233   0.38	223   0.37	218   0.36

Heat balance & cooling system		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
Heat dissipation (engine radiator) <sup>7)</sup>	kW   hp	57   76	73   98	141   189
Heat dissipation (CAC) <sup>7)</sup>	kW   hp	20   27	26   35	46   62
Heat dissipation (convection)	kW   hp	10   13	16   21	24   32
Cooling air flow	m <sup>3</sup> /h   cfm	7560   4450	13320   7840	18720   11018

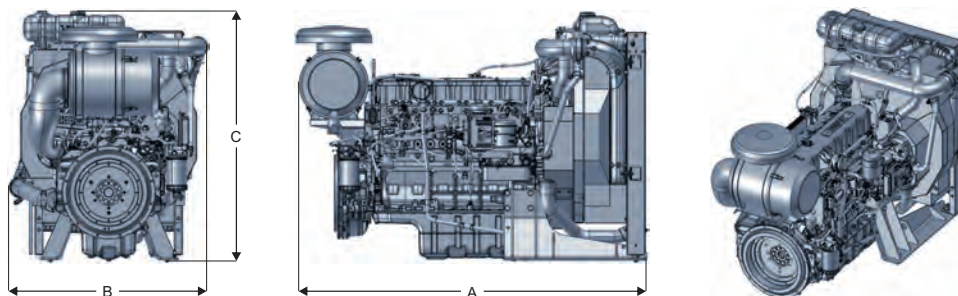
Inlet & exhaust data		TCD 2013 L4 2V	TCD 2013 L6 2V	TCD 2013 L6 4V
max. intake depression	mbar   psi	20   0.29	20   0.29	20   0.29
Combustion air volume	m <sup>3</sup> /h   cfm	492   290	660   388	858   505
max. exhaust gas temperature	°C   °F	540   1004	511   952	485   905
Exhaust gas flow	m <sup>3</sup> /h   cfm	1396   822	1806   1063	2270   1336

6) Refers to diesel with a density of 0.835 kg/dm<sup>3</sup> at 15°C | 6.96 lb/US gallon at 60°F.

7) The heat quantities are valid for the dimensioning of the cooling system.

The data on this data sheet are for information purposes only and are not binding values. The data in the quotation is definitive.

## Dimensions



		A	B	C
TCD 2013 L4 2V	mm	1589	880	1247
TCD 2013 L6 2V	mm	1909	879	1263
TCD 2013 L6 4V	mm	1865	1046	1322

Note: The engine dimensions and weights vary depending on the scope of delivery.

For more information please contact the DEUTZ AG Köln or the responsible sales partner.





# GENERATOR TYPE ECO 38-1LN/4

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Electrical Characteristics										
Frequency	Hz	50				60				
Voltage (series star)	V	380	400	415	440	415	440	460	480	
Rated power class H	kVA	250	250	250	230	290	300	300	300	
	kW	200	200	200	184	232	240	240	240	
Rated power class F	kVA	230	230	230	215	270	280	280	280	
	kW	184	184	184	172	216	224	224	224	
Regulation with DSR		±1 % with any power factor and speed variations between -5% +30%								
Insulation class		H								
Execution		Brushless								
Stator winding		12 ends								
Rotor		with damping cage								
Efficiencies class H	4/4	%	93,3	93,4	93,1	92,9	93,8	94,3	94,4	94,5
(see graph. for details)	3/4	%	93,4	93,7	93,6	93,3	94,3	94,5	94,7	94,9
	2/4	%	92,3	92,4	92,4	92,2	93,4	93,5	93,6	93,7
	1/4	%	90,1	89,9	89,7	89,5	90,6	90,6	90,6	90,4
Reactances (f. l.cl. F)	Xd	%	229,4	207	192,3	157,4	267,7	246,3	225,4	207
	Xd'	%	15,5	14,0	13,0	10,6	18,1	16,7	15,2	14,0
	Xd''	%	8,0	7,2	6,7	5,5	9,3	8,6	7,8	7,2
	Xq	%	129,6	117	108,7	89,0	151,3	139,2	127,4	117
	Xq'	%	129,6	117	108,7	89,0	151,3	139,2	127,4	117
	Xq''	%	24,4	22	20,4	16,7	28,5	26,2	24,0	22
	X <sub>2</sub>	%	17,7	16,0	14,9	12,2	20,7	19,0	17,4	16,0
	X <sub>0</sub>	%	2,7	2,4	2,2	1,8	3,1	2,9	2,6	2,4
Short Circuit Ratio	Kcc		0,41	0,44	0,68	1,11	0,32	0,38	0,41	0,44
Time Constants	Td'	sec.	0,085							
	Td''	sec.	0,013							
	Tdo'	sec.	1,30							
	Tα	sec.	0,017							
Short Circuit Current Capacity		%	>300				>350			
Excitation at no load	Amp.		0,6	0,71	0,8	0,95	0,4	0,5	0,58	0,7
Excitation at full load	Amp.		2,7	2,8	3	3,2	2,4	2,6	2,7	2,8
Overload (long-term)		%	1 hour in a 6 hours period 110% rated load							
Overload per 20 sec.		%	300							
Stator Winding Resistance (20°C)		Ω	0,0065							
Rotor Winding Resistance (20°C)		Ω	4,887							
Exciter Resistance (20 °C)		Ω	Rotor : 0,685				Stator : 15,28			
Heat dissipation at f.l.cl.H	W		14362	14133	14823	14062	15335	14507	14237	13968
Telephone Interference			THF < 2%				TIF < 40			
Radio interference			EN61000-6-3, EN61000-6-2. For others standards apply to factory							
Waveform Distors.(THD) at f. load	LL/LN %		2 / 2,1							
Waveform Distors.(THD) at no load	LL/LN %		2,9 / 3,1							
<b>Mechanical characteristics</b>										
Protection			IP 21 (other protection on request )							
DE bearing			6318.2RS							
NDE bearing			6314.2RS							
Weight of wound stator assembly	kg		231							
Weight of wound rotor assembly	kg		147,5							
Weight of complete generator	kg		680							
Maximun overspeed	rpm		2250							
Unbalanced magnetic pull at f.l.cl.F	kN/mm		5,1							
Cooling air requirement	m <sup>3</sup> /min		32				39			
Inertia Constant (H)	sec.		0,116				0,139			
Noise level at 1m/7m	dB(A)		82 / 69				86 / 73			

All technical data are to be considered as a reference and they can be modified without any notice

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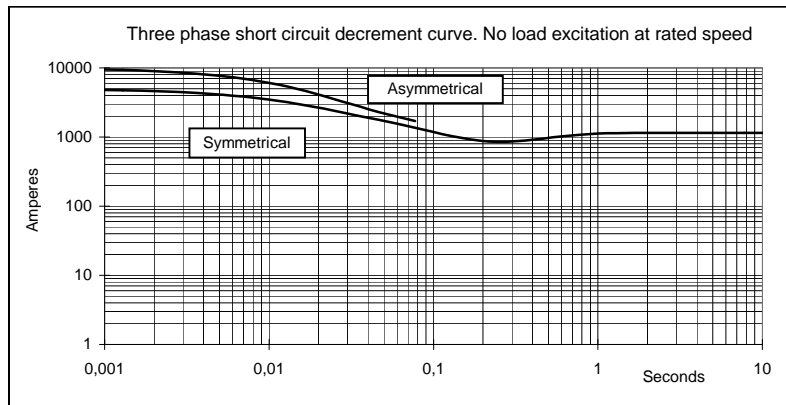
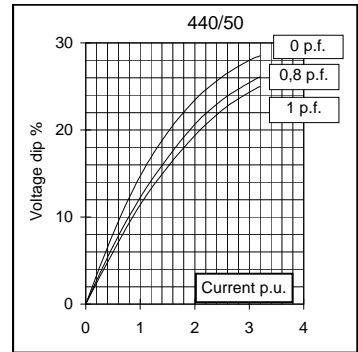
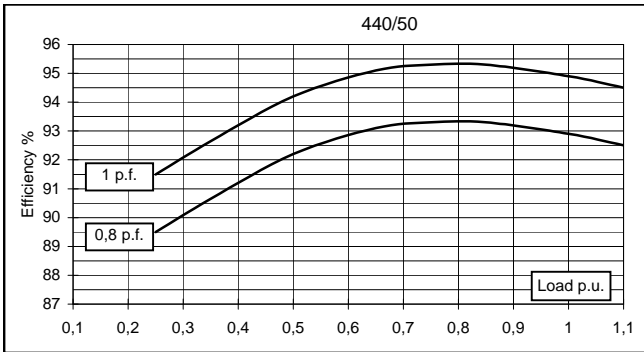
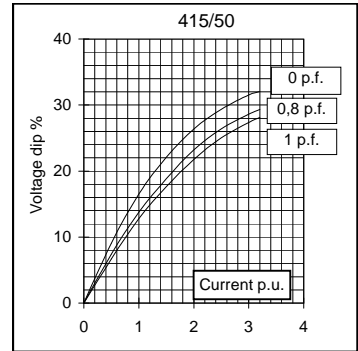
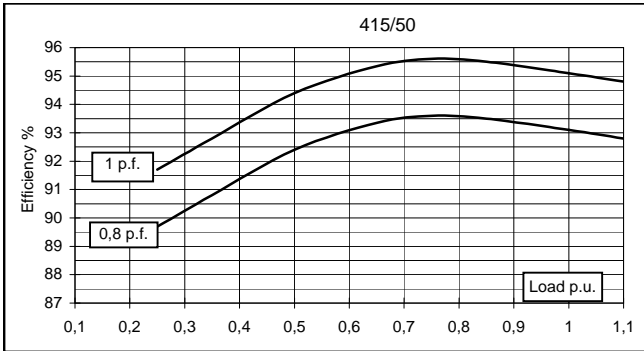
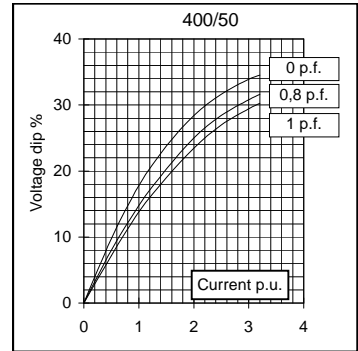
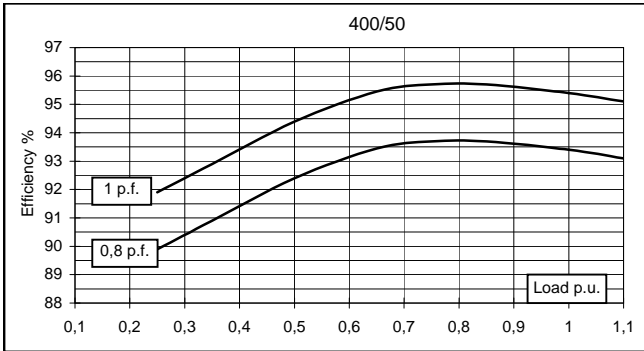
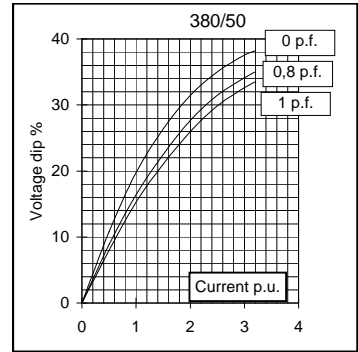
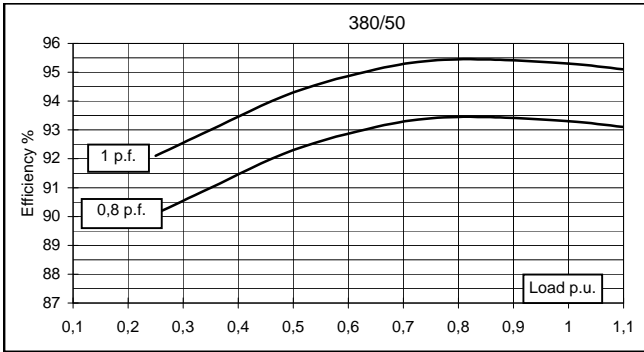


# GENERATOR TYPE ECO 38-1LN/4

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## 50 Hz

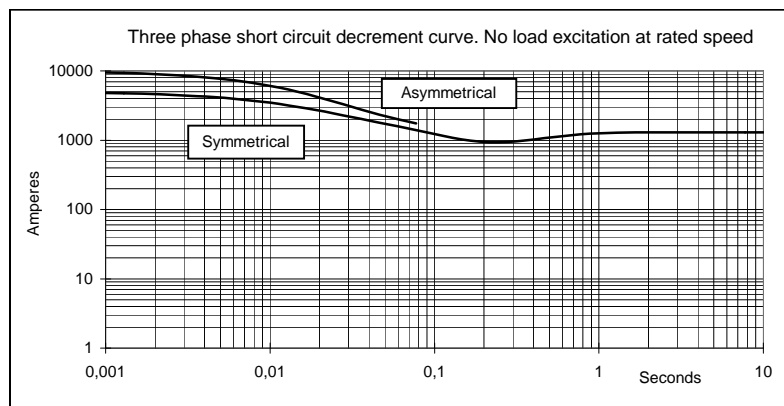
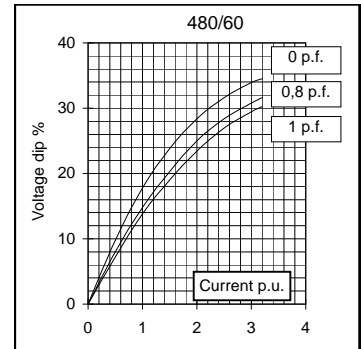
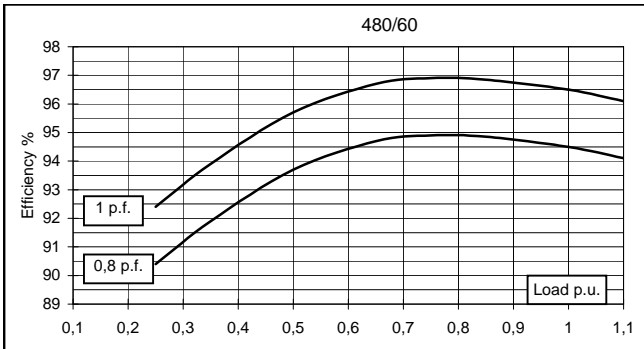
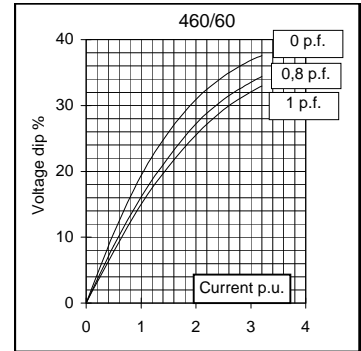
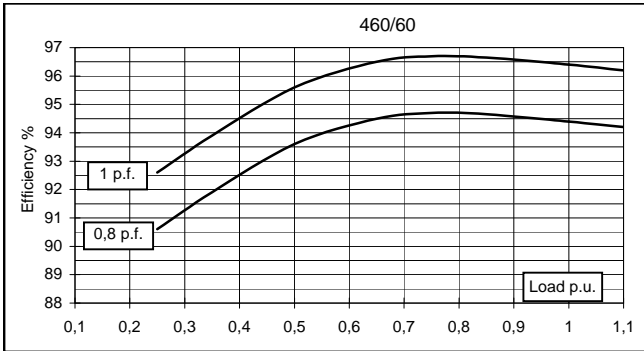
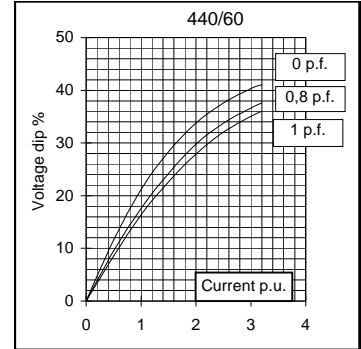
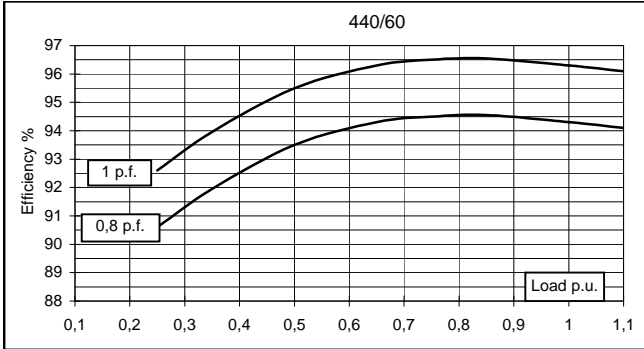
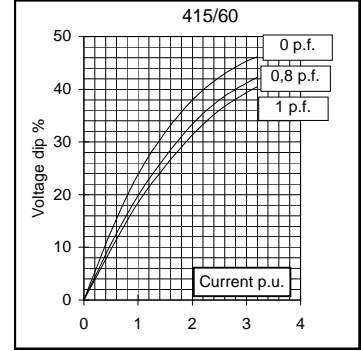
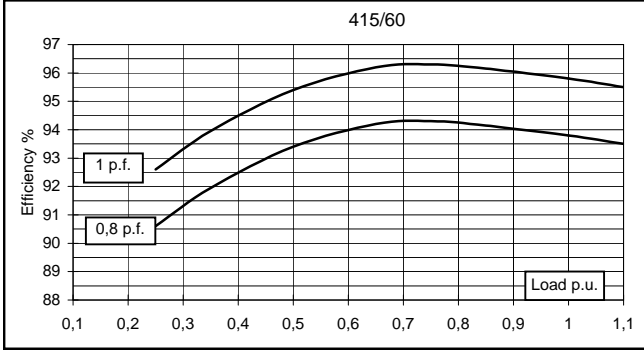




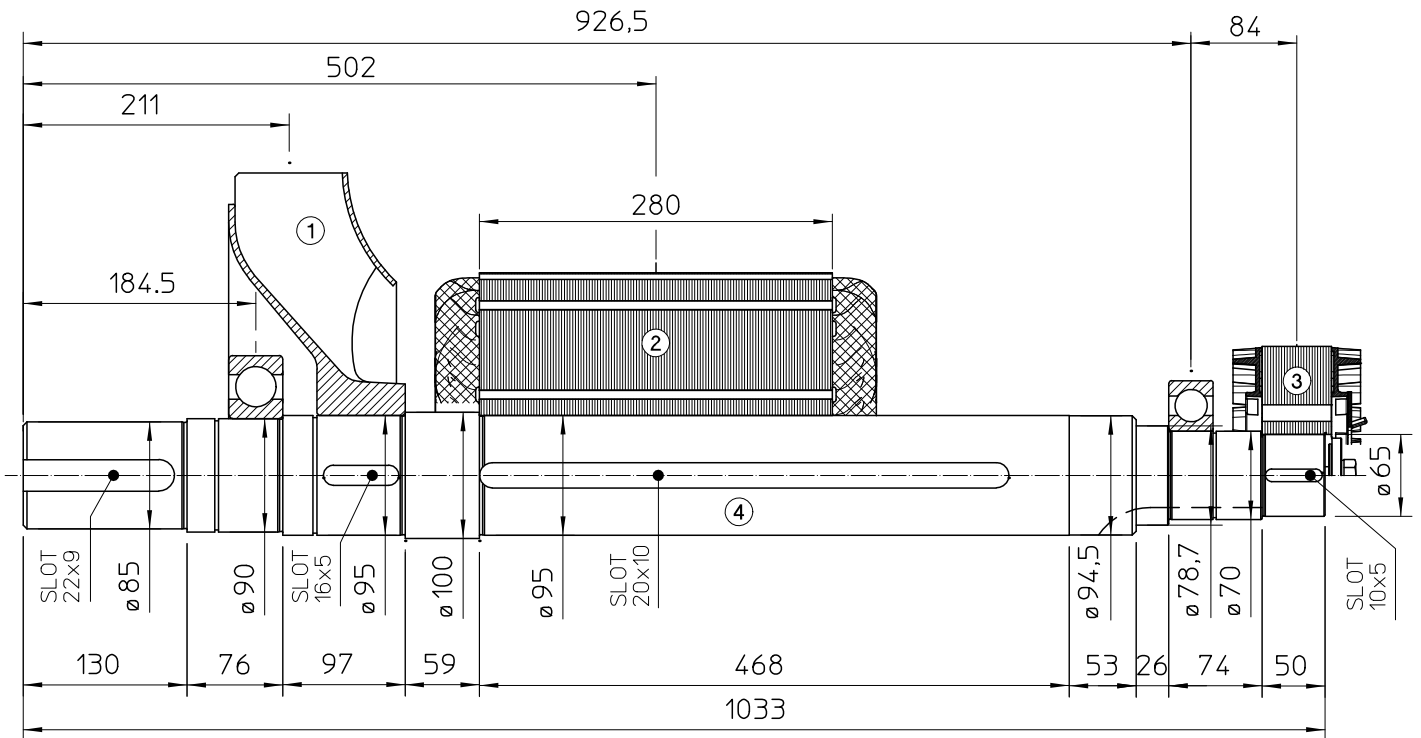
# GENERATOR TYPE ECO 38-1LN/4

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## 60 Hz

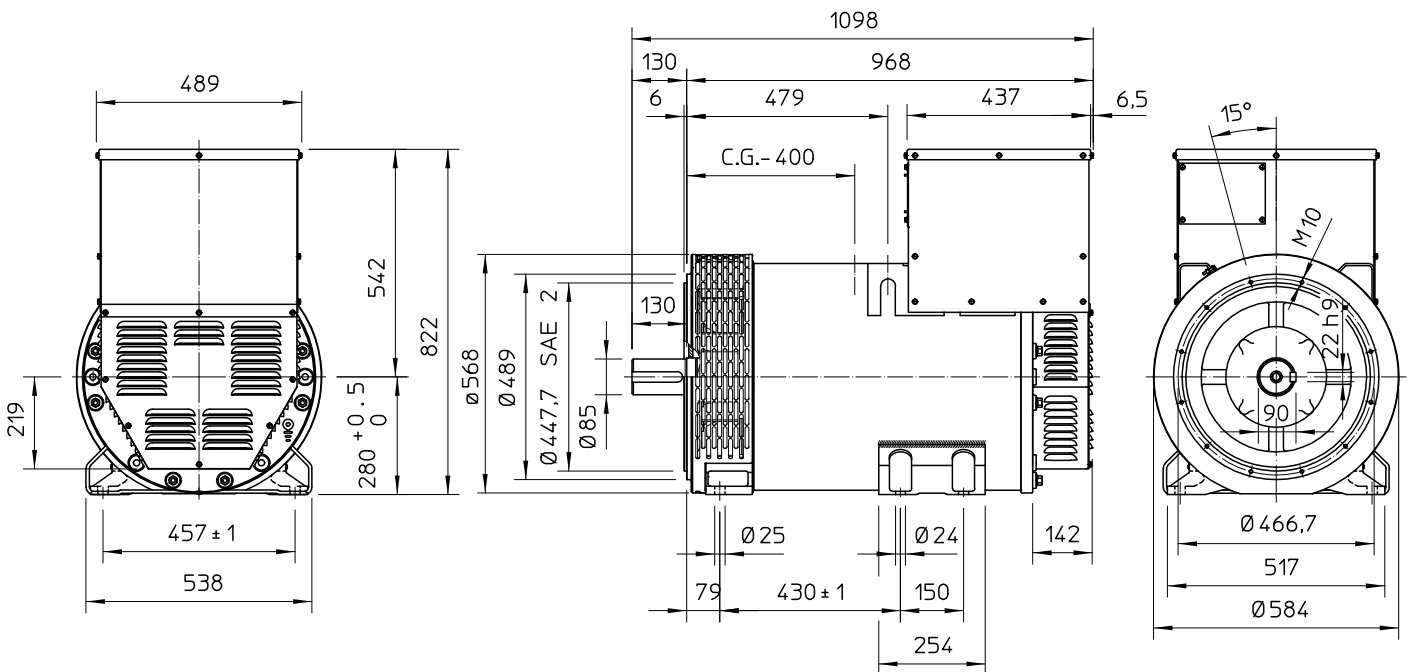


### TWO BEARING MOMENTS OF INERTIA

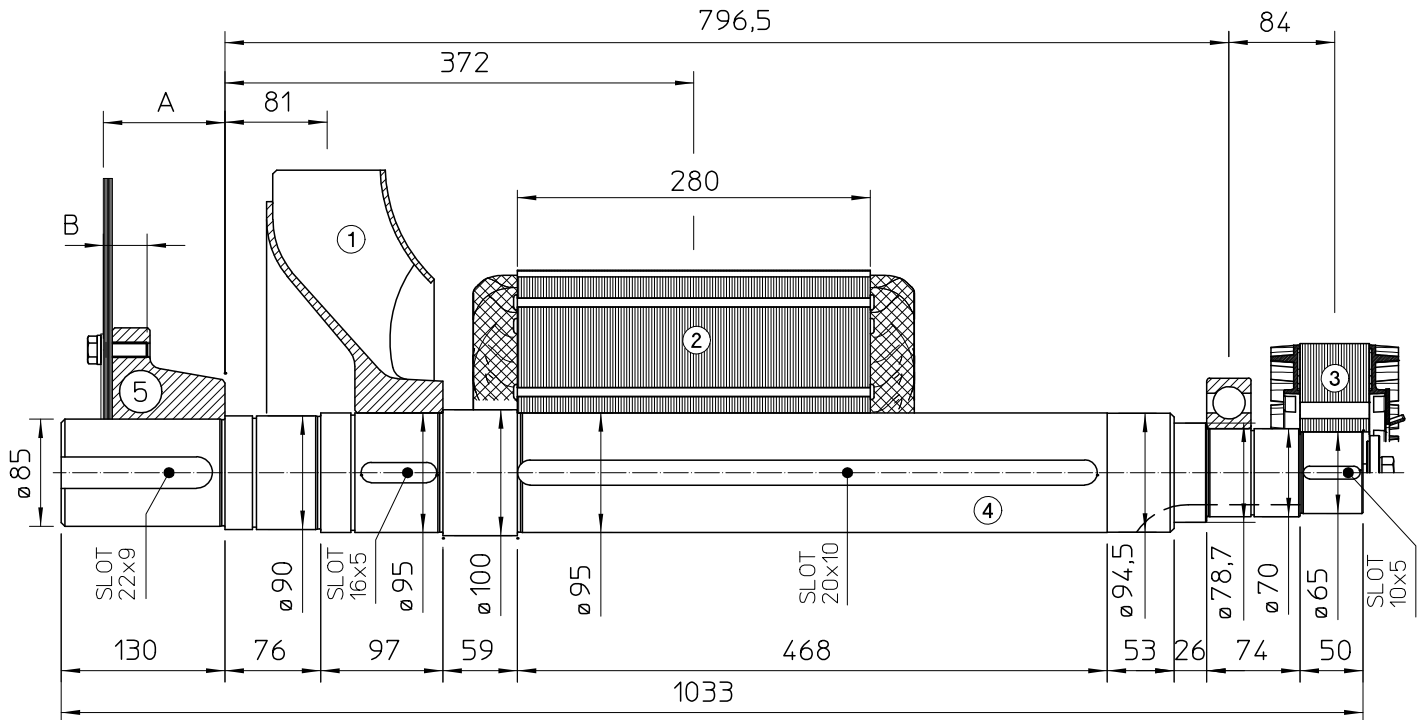


POS.	COMPONENT	WEIGHT (kg)	J (kgm <sup>2</sup> )
1	FAN	6.1	0.1887
2	MAIN ROTOR	147.5	2.0195
3	EX. ROTOR	14.5	0.0874
4	SHAFT	49.9	0.0525
TOTAL		218	2.3481

### TWO BEARING DIMENSIONS



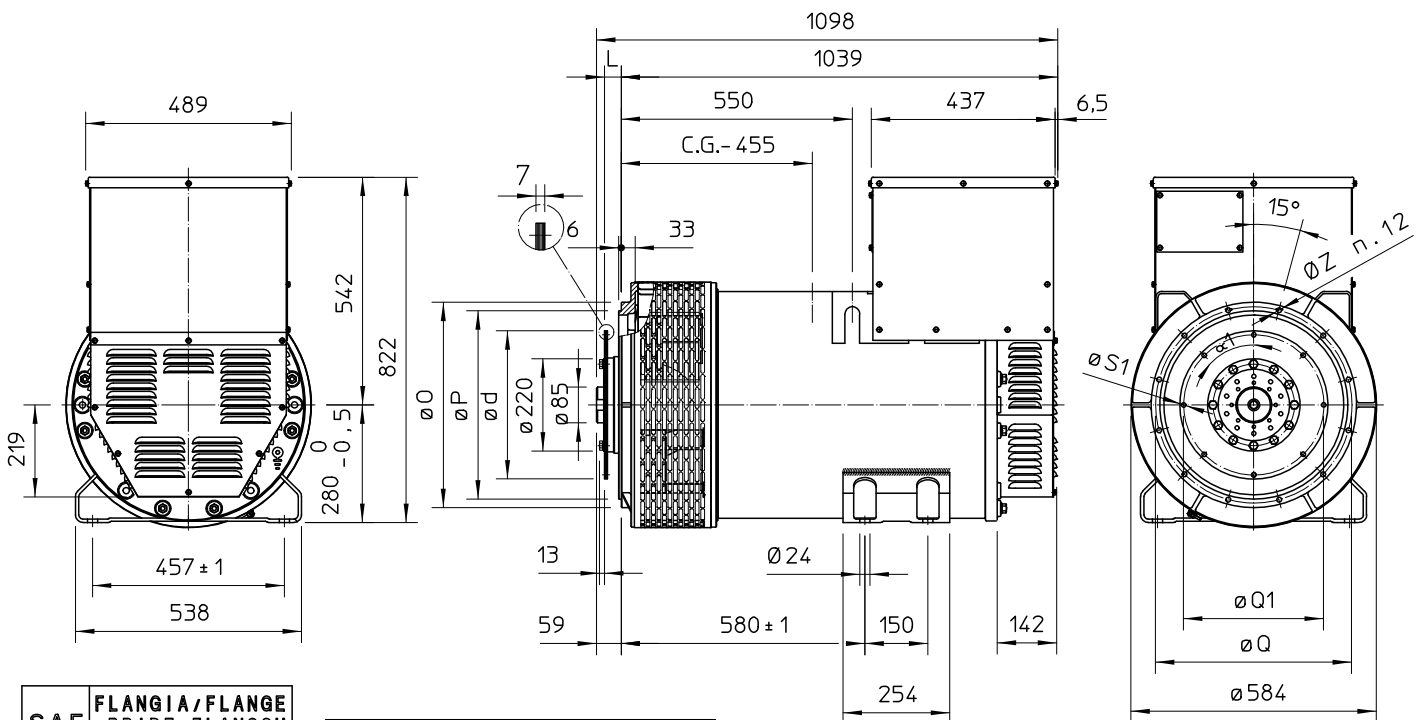
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J (kgm <sup>2</sup> )
1	FAN	6.1	0.1887
2	MAIN ROTOR	147.5	2.0195
3	EX. ROTOR	14.5	0.0874
4	SHAFT	49.9	0.0525
TOTAL		218	2.3481

SAE N°	5		SHAFTS COUPLING FLEX PLATE	
	A	B	WEIGHT kg	J kgm <sup>2</sup>
11.5	110.4	41.1	20.5	0.174
14	96.4	34.7	23.5	0.275

### SINGLE BEARING DIMENSIONS



SAE N.	FLANGIA/FLANGE BRIDE/FLANSCH		
	O	P	Q
3	451	409,6	428,6
2	489	447,7	466,7
1	552	511,2	530,2
1/2	648	584,2	619,1

SAE N.	GIUNTI A DISCHI DISC COUPLING DISQUE DE MONOPALIER SCHEIBENKUPPLUNG					
	L	d	Q1	n <sub>fori</sub>	S1	α1
11 1/2	39,6	352,42	333,37	8	11	45°
14	25,4	466,72	438,15	8	14	45°

C.G.= GRAVITY CENTER