A Induction Generator Data

ABB STRÖMBERG DRIVES

TEST RECORD

CUSTOMER THOMSON POWER STATION

QG 900 ZA 8L
140850

ORDER 2363LB001

88-06-30 PK A1

RATING

3-PHASE GENERATOR QG 900 ZA 8L IM 1001 NR. 140850
6300 KW S1 11000 V Y 382 A 753 R/MIN (----
50 HZ COS FI = 0.87 INSULATION CLASS F
TEMPERATURE RISE CLASS B

RESISTANCE (COLD)
UV 0.144800 OHM 28 C
UW 0.144800 OHM
VW 0.144700 OHM

INSULATION RESISTANCE OF STATOR WINDING
- BEFORE TEST 20000 MOHM 1000 V 28 C
- AFTER TEST 3000 MOHM 1000 V 42 C

HIGH VOLTAGE TEST OF STATOR WINDING
(80 % - SECOND TIME)
18400 V 1 MIN

NO LOAD Y 11000 V 105.2 A 72000 W 750 R/MIN (----

SHORT CIRCUIT Y 2439.0 V 381.5 A 167100 W IK= 1720.6 A

TEMPERATURE RISE TEST (----
-TWO FREQUENCY TEST 50/40 HZ

TIME	U/V	I1/A	R/MIN
8.00	10980.	382.0	750
11.30	10992.	382.0	750

TEMPERATURE RISE (K)

ARMATURE WINDING	48.5	BY RESISTANCE METHOD
ARMATURE WINDING	45.0	BY PT-100-METHOD
ROTOR	19.5	BY THERMOMETER

TEMPERATURE (C)

AIR IN	33.5	REFERENCE TEMPERATURE
BEARING D.E	57.0	BY PT-100-METHOD
- THRUST PADS	75.0	BY PT-100-METHOD
BEARING N.D.E	43.0	BY PT-100-METHOD
BEARING OIL, IN	25.0/26.5	(D.E/N.D.E)
OIL FLOW	12/6 DM3/S	(D.E/N.D.E)

OVERCURRENT: U = 11000 V I = 611 A T = 30 S

SHAFT VOLTAGE AT U =11000 V: UAC = 3200 MV UDC = 0 MV

MOMENT OF INERTIA: J = 1461 KGM2

ON BEHALF OF THE MANUFACTURER 88-06-30

ON BEHALF OF THE CUSTOMER 88-06-30

F. A. OPREL/FLUOR DANIEL B.V.
KNUT DAHL / EB KRAFTGENERING

ABB STRÖMBERG DRIVES
MACHINES

2(3)
pk A1

1988-06-30

QG 900 ZA 8L
nr. 140850

CALCULATING OF EFFICIENCY AND COS PHI,
ACCORDING TO IEC 34-2 (1972)

LOAD (%)	105	100	95	75	50	25
U (V)	11000	11000	11000	11000	11000	11000
I (A)	394.2	375.9	357.9	288.0	206.5	137.7
P1 (kW)	6787.0	6462.7	6138.9	4848.6	3246.3	1655.1
cos phi	0.88	0.88	0.88	0.86	0.80	0.60
Riou 75C(ohm)	0.1706	0.1706	0.1706	0.1706	0.1706	0.1706
slip (%)	0.421	0.401	0.381	0.302	0.202	0.102
Prho L	20.30	20.30	20.30	20.30	20.30	20.30
Pfe o	49.14	49.14	49.14	49.14	49.14	49.14
P1ou s (kW)	39.77	36.16	32.78	21.23	10.91	4.85
P2ou s	28.20	25.58	23.09	14.41	6.43	1.63
Pa e	34.63	31.50	28.55	18.48	9.51	4.23
Pt s	172.04	162.68	153.86	123.56	96.29	80.15
P2 (kW)	6615.0	6300.0	5985.0	4725.0	3150.0	1575.0
Efficiency (%)	97.5	97.5	97.5	97.5	97.0	95.2
Torque (Nm)	83870	79895	75915	59980	40025	20030

Prho = friction losses (from no load curve)
PFe = iron losses (from no load curve)

P1ou = Cu-losses in primary windings
= 1.5*Riou 75 C*(I1)**
P2ou = Cu-losses in secondary windings
= s*((P2+(PFe+P1ou))

Pan = additional load losses
= 0.005*P2n (at nominal load)
Pa = Pan*(I/In)** (P2 < P2n)

Pt = total losses
= (Prho + PFe + P1ou + P2ou + Pa)

P1 = input power
P2 = output power

efficiency = 100*(P2/P1) (%)

GENERATOR / TURBINE / FLYWHEEL

INERTIA GD^2 = 5.2 t.m²

REVISION 6/11/87.

TRANSFORMER VECTOR GROUP DYN11 (Delta on 22KV SIDE)

QHG 900 ZA 8 L

Resistances and reactances:

Stator resistance	R_1	= 0.0903 Ω	0.087 Ω
Magnetizing reactance	X_h	= 47.8 Ω	56.4 Ω
Transformation ratio	U	= 4.593	4.593
$R_2' = \ddot{U}^2 R_2$	$X'_{\sigma 2}$	= $\ddot{U}^2 X_{\sigma 2}$	

1. Slip = 0

Stator reactance	$X_{\sigma 1}$	= 2.03 Ω	2.226 Ω
Rotor resistance referred to stator	R'_2	= 0.064 Ω	0.067 Ω
Rotor reactance referred to stator	$X'_{\sigma 2}$	= 1.568 Ω	1.662 Ω
Impedance	Z_K	= 3.6 Ω	3.89 Ω

2. Slip = 1

Stator reactance	$X_{\sigma 1}$	= 1.784 Ω saturated	1.93 Ω
" "	$X_{\sigma 1}$	= 2.03 Ω unsaturated	2.226 Ω
Impedance	Z_K	= 2.784 Ω saturated	2.976 Ω
Rotor reactance referred to stator	$X'_{\sigma 2}$	= 0.981 Ω saturated	1.029 Ω
Rotor reactance referred to stator	$X'_{\sigma 2}$	= 1.117 Ω unsaturated	1.187 Ω
Rotor resistance referred to stator	R'_2	= 0.2263 Ω	0.238 Ω

FIGURE 3. MACHINE DATA