

2.9 GENERATOR AND ACCESSORIES

Brushless synchronous generator

(See also original manufacturer documentation at the set of Components documentation)

2.9.1 TECHNICAL SPECIFICATION

KIND OF MACHINE :	GENERATOR	SERIAL No. :	12010556	YEAR OF MANUFACTURE :	2011
MACHINE CODE :	SGEN5-100A-4P	FREQUENCY :	50 Hz	DIRECTION OF ROTATION :	CW
NUMBER OF PHASES :	3	CONNECTION :	YYYY	PHASE SEQUENCE :	U1 V1 W1
RANGE OF RATED VOLTAGE :	10500 V +5/-5%	RATED CURRENT :	2089 A	RATED SPEED :	1500 min ⁻¹
RATED POWER :	38000 kVA	RATED POWER FACTOR :	cos φ = 0,85	CLASS OF RATING :	S1
TYPE OF EXCITATION :	SELF EXCITATION	TYPE OF COOLING :	AIR COOLING		
CLASS OF INSULATION DESIGN :	F	COOLING AIR TEMP :	38 °C	DEGREE OF PROTECTION :	IP 54
TEMP. RISE CORRESPONDS TO CLASS :	B	TYPE OF CONSTRUCTION :	IM 1005		
TOTAL WEIGHT :	57.600 kg	RATING AND PERFORMANCE STANDARD :	IEC 60034		
ROTOR WEIGHT :	15.900 kg	STATOR WEIGHT :	24.600 kg		

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2.9.2 MECHANICAL DATA

RATINGS			
POWER	38,000	MVA	
P.F.	0,85		
SPEED	1500	min ⁻¹	
DIRECTION OF ROTATION, VIEW FROM TURBINE TO GEN.	rechts/ clockwise		
VOLTAGE	10,5 +/-5 %	kV	
CURRENT	2089	A	
FREQUENCY	50	Hz	
THERMAL TIME CONSTANT STATOR	9,04	min	
THERMAL TIME CONSTANT ROTOR	12,06	min	
CAPACITY STATOR WINDING AGAINST EARTH PER PHASE	0,210	μF	
CAPACITY ROTOR WINDING AGAINST EARTH	0,040	μF	
RATE OF COOLING AIR	12,5	m ³ /s	
COOLING AIR TEMPERATURE	38	°C	
HEAT LOSS (COOLER)	553	kW	
SOUND PRESSURE LEVEL (ISO 3744)	85	dB(A)	
TYPE OF CONSTRUCTION			
TYPE OF CONSTRUCTION	IM 1005		
DEGREE OF PROTECTION	IP 54		
METHODS OF COOLING	IC8A1W 7		
COLOR	RAL 7030		

WEIGHTS			
ROTOR COMPLETE	15900	kg	
STATOR ACTIV PART	24600	kg	
CASING, BEARINGS	8100	kg	
HOUSING	3200	kg	
COOLER	1200	kg	
EXCITER (STATOR)	900	kg	
MAIN TERMINAL BOX	3200	kg	
ACCESSORIES, ANCHORING	500	kg	
TOTAL WEIGHT	57600	kg	
MAX. WEIGHT ROTOR REMOVAL	17100	kg	
MAX. TRANSPORT WEIGHT	53900	kg	
MIN. ALLOWED TRANSPORT TEMPERATURE	-20	°C	
EXCITATION			
EXCITER MACHINE	ELR 75/11-15/16-2		
PMG	ELP 75/5-18/24		
MECHANICAL DATA			
MOMENT OF INERTIA ($M \cdot R^2$) (ROTOR COMPLETE)	2284	kgm ²	
BREAK AWAY TORQUE WITH PRESSURE OIL	66	Nm	
BREAK AWAY TORQUE WITHOUT PRESSURE OIL	5508	Nm	
MIN. TURNING SPEED WITH JACKING OIL	-	min ⁻¹	
MIN. TURNING SPEED WITHOUT JACKING OIL	55	min ⁻¹	
BEARING FRICTION LOSSES TOTAL	16	kW	
PERMISSIBLE OVERSPEED FOR FAULT CONDITION	+ 10	%	

TERMINAL BOX			
TERMINAL BOX	+MKA10GA010		
FOR WARM AIR RESISTANCE THERMOMETER	1	2*Pt100	
FOR COLD AIR RESISTANCE THERMOMETER	6	2*Pt100	
IN THE STATOR WINDING RESISTANCE THERMOMETER	9 (+3 Reserve) 9 (+ 3 SPARE)	Pt 100	
BEARING THERMOMETER	2 x 1	2*Pt 100	
LEAKAGE WATER MONITORING	3		
TERMINAL BOX	+MKA10GE030		
ANTICONDENSATION HEATER GENERATOR	3 x 400 50 2 x 1,6	V Hz kW	
AND EXCITER MACHINE (SEE ITEM 63)	230* 50 2 x 100	V Hz W	
* SUPPLIED BY 400V FEED			
TERMINAL BOXES	+MKD10GA010 +MKD20GA010		
PROXIMITORS SHAFT VIBRATION MEASUREMENT	Bently Nevada 3300XL		
AUXILLARY TERMINAL BOX FOR MAIN TERMINAL CUBICLE	+MKA10GE010		
GROUNDING BRUSH			
RELATIVE SHAFT VIBRATION MEASUREMENT TWO BORES WITH SCREW 3/4"- 14NPT DISPLACED BY 90° ON THE BEARING COVER TE AND EE.			
VIBRATION PICKUP TYPE:	Bently Nevada 3300XL		

COOLER			
COOLER NUMBER OF ELEMENTS:	2x50	%	
ADMISS. GENERATOR OUTPUT WITH ONE COOLER ELEMENT (CLASS F)	67	%	
COOLING WATER RESISTANCE	< 0,5	bar	
NORMAL WATER INLET TEMPERATURE	33	°C	
MINIMUM WATER INLET TEMPERATURE	15	°C	
WATER OUTLET TEMPERATURE	37	°C	
REQUIRED WATER FLOW	118	m³/h	
DESIGN PRESSURE	6	bar	
TESTING PRESSURE	9	bar	
FOULING FACTOR	0,00009	m² °C/W	
COOLER DESIGN: GLICOL	35	%	
COOLER MATERIALS **			
TUBES	SF-Cu		
FINS	Al		
TUBE SHEETS	CuZn38SnAl		
WATERBOXES, FLANGES	Steel + Epoxy		
COOLER VENTS COCK	G1/2"		
COOLER DRAIN COCK	G1/2"		
COOLING WATER CONNECTION FLANGE WITH COUNTER FLANGE LEAKAGE WATER SENSOR	ANSI 3" B16.5 150lbs		
SAFETY VALVE			
SET UP PRESSURE	6	bar	
MATERIAL ARRANGEMENT WITHOUT COOLING WATER ANALYSIS			

EXCITATION EQUIPMENT			
MAIN EXCITER	ELR 75/11-15/16-2		
PMG	ELP 75/5-18/24		
DEGREE OF PROTECTION	IP 54		
VALUES	s. Erreger- und Reglerangaben!/ See excitation data sheet!		
TERMINAL BOX	+MKC20GE010		
FIELD WINDING	F1 F2		
ANTICONDENSATION HEATER			
TERMINAL	+MKC20GA010		
GROUND FAULT MEASURING INSTRUMENT	IY4 IY3 - +		
BRUSH-LIFTING GEAR	IY2 IY1 - + 220 V DC		
TERMINAL BOX	+MKC10GE010		
PMG	A1 B1 C1		
REDUNDAND SUPPLY			