


**ABB Offshore Systems AS**  
an ABB oil and gas company



A4	26.01.01	Added Earth Fault Details	A.B.		
A3	10.11.00	Changed CB Setting	A.B.		
A2	02.11.00	Changed power output possibilities	A.B.		
A1	28.09.00	As built	A.B.	STAK	
B	25.08.2000	Reissued for approval	AB		
A	07.07.2000	Issued for approval	AB		
Proj. rev. code	Issue date	Reason for issue	Made by	Chk'd by	Appr. by


P.O. Number 4500025484	Package Title  Backup generator SLB
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Tag No.(s)  W-08-EZ01, W-08-EG01, W-08-EG01(D), W-72-SH02, W-08-EF01
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Supplier logo  	For Project use only:			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	Date 26/9-00		Sign. STAK	

Supplier Document Number  E01.001
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Project Code P105014	Area/Location C30W	System Code 08
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 <b>ABB Offshore Systems AS</b> CONTRACT ANS 021248 SLEIPNER V&M	
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Document title (must be identical to entry on SMDR)  Equipment data sheets
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SDRL Code(s)  6.2.1, 6.2.2	Statoil Document ID DE
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Project Document No.  C034-B-A-DE-2120	Page <b>1 of 17</b>
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	EQUIPMENT DATA SHEET Back-up-Generator (Set E5745)	No. C034-B-A-DE-2120 Rev. C Date Mar 1999  Page 2 of 17
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Back-up-Generator (Set E5745)

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## Machine datasheet

1	Model	Ref	NHC20/KTA50G3	
2	Part Number	Ref	602020 602027 602032 602033 602034	602040 602052 602054 602055 602056
3	Specification	Ref	G32.0016	
4	Installation Drawing SEE	Ref	A05.0105	
5	Maximum Ambient	<sup>0</sup> C ( <sup>0</sup> F)	45 (113)	
6	Electrical Output ISO 8528-1 -Continous Power (COP) -Prime Power (PRP) -Permissibli average of PRP ISO 3046/1 -Fuel Stop Power/standby Single Step load aplication	Hz  KW(kVA) KW(kVA) %  KW(kVA) %	60  870(1080) * <b>Note h</b> 1165(1456) 70  1294(1618) 56	
7	Alternator Class F Temp. Rise (105 <sup>0</sup> C) -Three phase -Single phase Ends out Make & Type Ser nr. Maskin id. AVR Regulation	  KW(kVA) KW(kVA)    %	  1080(1350) - 6 Newage Stamford HCI734F2 C081733/01 97282081 <a href="#">MX321(1-4)</a> ± 0,5	
8	Circuit Breaker Make & Type Number of poles Rating Trip unit type Overload protection range Short circuit protection range	   Amps  Amps Amps	    Electronic 1260 – 2750 3150 – 40,000	
9	Load terminals Type		Busbar M12	
10	Fuel Consumption	lit/hr	0,2719 l/ kW/hr	



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11	Running Hours At 870kW	Hours	5,07	
12	Exhaust Emissions Measurement Method Specific Load Nox-Oxides of Nitrogen PM-Particulate Matter CO-Carbon Monoxide HC-Unburnt Hydrocarbons	(g/kW.h)	Cummins Exhaust emissions 100% Prime ± 2% CPL2227 17,82 0,07 0,67 0,20	
13	Exhaust Silencer Make & Type Spark arrestor Serial No. Contract No. Order No. Certificate Permissible back pressure	Ref Ref Ref No. mm (ins)Hg	Bradgate Industrial & Marine Silencers BR25878-23 C97/5438+KTA50G M25878 DnV M-8154 13(0,5")	
14	Noise (ISO 3746) Sound Power-EEC Certificate Sound Pressure at 1 metre Sound Pressure inside cont Vibration (ISO 2631-2)	dBA (SWL) Yes dBA (SPL) dBA (SPL)	110 ( <a href="#">C034-B-A-KV-2120</a> ) 89 108 < 3	
15	Engine Make & Type Engine nr. Cylinders & Form Aspiration Fuel Pump Governor Type Make & Model Steady state frequency Battery Voltage	% Volts	Cummins Diesel KTA 50G3 CPL2227 33138152 V16 600 Turbocharged & After cooled Cummins PT Electronic Cummins EFC ± 0,25 24	
16	Overall Dimensions -Lenght -Width -Height	Metres(feet) Metres(feet) Metres(feet)	6,18 (20'3") 2,44 (8'0") 2,60 (8'6")	+++++ +++++ extentions
17	Weight	Kg(lbs)	C034-B-A-QM-2120	<a href="#">See sert</a>



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18	Capacities -fuel day tank gross usable -Lub oil total pan -Coolant	Litres(USgall)	1431 (378,1) 1288 (340,3) 177 (46,7) 151-121 (40-32) 383 (101,2)															
19	External fuel supply Direct line -maximum above base -maximum below base Via tank Max Min	Metres(feet) Metres(feet) Barg Barg	2,40 (7'10") 1,50 (4'11") 10 0,5															
20	<p>Surface treatment of generator unit nr E5745</p> <table border="1" data-bbox="244 958 1410 1111"> <tr><td>1. Sandblasting outside to SA.2</td></tr> <tr><td>2. Touching tight places and rough welding's</td></tr> <tr><td>3. 1 Coat Inter Zone 954 Grey 200-300 µm</td></tr> <tr><td>4. 1 Coat Inter Gard 740 Ral 7001 (Grey) 50-100 µm</td></tr> </table> <p>-----</p> <p>Surface treatment of exhaust plate generator unit nr E5745</p> <table border="1" data-bbox="244 1263 1410 1447"> <tr><td>1. Sandblasting outside to SA.2</td></tr> <tr><td>2. Touching tight places and rough welding's</td></tr> <tr><td>3. 1 Coat Inter Zone 954 Grey 200-300 µm</td></tr> <tr><td>4. 1 Coat Inter Thane 990 silver color 50-100 µm</td></tr> <tr><td>5. 1 Coat crystal clear lacquer ca 50 µm</td></tr> </table> <p>-----</p> <p>Surface treatment of base plate generator unit nr E5745</p> <table border="1" data-bbox="244 1599 1410 1711"> <tr><td>1. Sandblasting outside to SA.2 +/-</td></tr> <tr><td>2. 1 Coat Inter Zone 954 Grey 200-300 µm</td></tr> <tr><td>3. 1 Coat Inter Thane 990 black 50-100 µm</td></tr> </table> <p>Touch areas is cleaned, founded and painted.</p> <p>Surface treatment of Exhaust unit nr E5745</p> <table border="1" data-bbox="244 1895 1410 1973"> <tr><td>1. Sandblasting outside to SA.2</td></tr> <tr><td>2. 1 Coat Inter therm 50 finish aluminium temp max 540 50-100 µm</td></tr> </table>				1. Sandblasting outside to SA.2	2. Touching tight places and rough welding's	3. 1 Coat Inter Zone 954 Grey 200-300 µm	4. 1 Coat Inter Gard 740 Ral 7001 (Grey) 50-100 µm	1. Sandblasting outside to SA.2	2. Touching tight places and rough welding's	3. 1 Coat Inter Zone 954 Grey 200-300 µm	4. 1 Coat Inter Thane 990 silver color 50-100 µm	5. 1 Coat crystal clear lacquer ca 50 µm	1. Sandblasting outside to SA.2 +/-	2. 1 Coat Inter Zone 954 Grey 200-300 µm	3. 1 Coat Inter Thane 990 black 50-100 µm	1. Sandblasting outside to SA.2	2. 1 Coat Inter therm 50 finish aluminium temp max 540 50-100 µm
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General Notes											
a	On KTA50G3 engines built to CPL2227 (i.e. offset pistons and rematches turbos), a continuous base load power limit of 800kW @ 50Hz is applied										
b	Gas Detector system is fitted										
c	Flame Detector system is fitted										
d	Fuel Level control system is fitted										
e	Fuel Filling control system is fitted										
f	Fire Damper system is fitted										
g	<p>Inergen Fire extinguishing system is fitted</p> <p>Se file nr.</p> <table border="1"> <tr> <td><a href="#">801488, IV4 user dk-uk</a></td> <td>Bruker manual for inergen ventil</td> </tr> <tr> <td><a href="#">Inergen</a></td> <td>Beskrivelse av virkemåten til inergen</td> </tr> <tr> <td><a href="#">inergencomponents FECYL</a></td> <td>Inergen flasker spesifikasjoner</td> </tr> <tr> <td><a href="#">Inergenkomponenter Npp-iv4</a></td> <td>Inergen utløseventil</td> </tr> <tr> <td><a href="#">nr2service kit</a></td> <td>Servise kit inergenventiler</td> </tr> </table>	<a href="#">801488, IV4 user dk-uk</a>	Bruker manual for inergen ventil	<a href="#">Inergen</a>	Beskrivelse av virkemåten til inergen	<a href="#">inergencomponents FECYL</a>	Inergen flasker spesifikasjoner	<a href="#">Inergenkomponenter Npp-iv4</a>	Inergen utløseventil	<a href="#">nr2service kit</a>	Servise kit inergenventiler
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<a href="#">nr2service kit</a>	Servise kit inergenventiler										
h	<p>Diesel Power can be increased to Prime 1240 kW &amp; continues 1000kW by removal of exhaust cooler</p> <p>Gen Power can be increased to 1500kVA by adding more cables to SLB from generator.</p>										

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## Machine data explanation

### 1. General Description

**Features:-**

**AMBIENT** Up to 45°C

**NOISE** See datasheet ([C034-B-A-KV-2120](#))

**SPILLAGE** All potential leakage from engine and fuel tank contained within banded genset compartment.

**FUEL** 5 hour capacity fuel day tank

**HANDLING** CSA certified ISO Container with corner castings DNV 2.7-1 lifting system

**CE MARK Compliance after January 1995**


Package comprises of custom built ISO container housing diesel generator set, cooling systems, exhaust silencing system and fuel tank. Container is divided into two separate compartments. The larger compartment houses the diesel generator set, fuel tank and controls and the smaller compartment houses large surface area cooling radiator and low speed roof mounted Ex fan. Walls of generator set compartment are fully lined with non-combustible mineral fibre acoustic linings retained by galvanised perforated steel sheet. Ventilation air inlets and outlets are fitted with noise attenuators.

### 2. Lifting

Package may be lifted by four corner castings on roof of container. Or DNV 2.7-1 lifting arrangement.

### 3. Installation

Package may be installed on firm level ground or decking. If holding down arrangement is required, deck locators may be used or container welded down at bottom corner castings, which are cast carbon steel.

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#### **4B Access - Above 750kVA**

Personnel doors are provided on each side of container giving access to generator set compartment and further access is provided into radiator and fan compartment via generator set compartment. Access ladder is provided at rear of container giving access to roof and radiator filling cap.

#### **5. Paint Finish (Repainted see details page 5)**

Container and generator set base are grit blasted after fabrication and painted in accordance with Aggreko Standard system giving high protection against damage, corrosion and sun light.

#### **6. Cooling**

Package incorporates two separate cooling systems for diesel engine and generator set compartment ventilation.

Engine & exhaust cooling air enters container through acoustic weather louvers on end of container, and then passes through vertically mounted radiators. Hot air is discharged vertically upwards by roof mounted electric motor driven axial flow fan. In order to achieve low noise emissions large surface area radiator is used in conjunction with a low pressure, Ex some 1 fan of large diameter running at low speed.

Generator set compartment is ventilated by a small electric motor driven high-pressure fan mounted within compartment, drawing cold air through acoustic louvers and filter panels in end of container. Warm air is discharged from fan through horizontal attenuator duct and then vertically upwards through roof outlet. Outlet incorporates vertical blades and water drain to prevent ingress of rain water into generator set compartment.


#### **7. Exhaust Silencers**

Spark arrestor exhaust silencer is mounted through roof immediately above the diesel engine and forms part of the roof.

There is also added exhaust cooler on top of the container, and a spark arrestor exhaust silencer is mounted directly after the cooler.

#### **8. Fuel Tank**

Fuel tank is mounted within generator set compartment, which incorporates bund with capacity in excess of 120 percent of fuel tank capacity.

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Tank fittings include filler connections through each side of container, bolted top access cleaning covers and contents sight glass.

## 9. Fuel Filtration

Two stage filtration is provided by multiple RACOR type water separating filter and fine filters for protection of fuel injection system.

## 10. Diesel Engine

Diesel engine is four-stroke direct injection type running at 1800r.p.m. for 60Hz

## 11. Radiators


Radiators are of vertical flat finned tube type with generous header tanks top and bottom. Radiators are sized for standby operation at ambient specified in Data Sheet with 50% glycol/water coolant and generous fouling allowance. Cooling systems are all pressurised.

## 12. Coupling

Diesel engine is directly coupled to alternator by means of rubber flexible coupling selected to eliminate critical torsional vibration at running speeds and during single cylinder mis-fire.

## 13. Alternator

Alternators are rigidly bolted to diesel engine flywheel housing by means of SAE size flange adaptor, such that engine and alternator become one integral assembly. Alternators are brushless rotating field type with permanent magnet exciter and solid state automatic voltage regulator. Rotor is mounted on sealed for life ball race bearings. Windings have class H insulation and are vacuum pressure impregnated in polyester resin and heavy coat of epoxy resin offering maximum protection against moisture, high humidity, salt and sand contamination. Alternator is open ventilated with integral centrifugal cooling air fan. Replaceable air filter panel is provided at air inlet to the alternator.

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#### 14. Engine Alternator Mounting

Engine/Alternator assemblies are mounted on skid base by means of rubber in shear anti-vibration mountings with positive restrain in the event of rubber failure.

#### 15. Control Panel

Control panels are mounted above alternator on a rigid plate, which is attached to alternator by anti-vibration mountings. There are two separate panels with one accommodating generator set controls and instrumentation and other circuit breaker and load connections.

#### 16A Control and Instrumentation

Controls:- Manual / off / Auto Switch

Start Button

Safety On Light

Alarm Annunciator

- Low coolant pressure
- Low oil pressure
- High coolant temperature
- Over speed
- Circuit Breaker tripped
- Fan protection tripped
- Over voltage
- Reverse power
- Air shut off valve closed/ESD
- Automatic start failure (KTTA19 & VTA28 only)
- Fuel spillage
- Inergen Release button.

Manual or Automatic Starting and Stopping of generator set is selected by three position switch. Three attempt start sequence occurs in 'Auto' only.

Others:-

Generator Earth Fault

Speed increase/decrease switch

Circuit Breaker Local/Remote Switch

Circuit Breaker Open/Close Buttons

Dead Bus Relay

Load Sharing Module with Reverse power

Load Sharing on/off switch

Electronic Governor

Automatic Voltage Regulator

Speed sensing relay

Voltage Potentiometer


Generator & Busbar Test Socket

Instruments:- Frequency Meter

Voltmeter

Ammeters (3)

Kilowatt meter

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Check Synchroniser  
Engine Oil Pressure  
Engine Coolant Temperature  
Hours Run meter  
Battery Volts meter

### **17A. Circuit Breaker Section - Below 750kVA (not applicable)**

3 or 4 Pole moulded case circuit breaker with motor operator and suitably rated overload and short circuit protection of alternator. Flexible connections are provided between alternator output terminals and circuit breaker. Air circuit breaker used on low voltage specification for USA.

### **17B. Circuit Breaker Section - Above 750kVA**

3 or 4 Pole air circuit breaker with suitably rated overload and short circuit protection of alternator. Customised alternator output terminal posts are connected to circuit breaker by flexible links. Current transformers are mounted on rigid output bus bars from circuit breaker.

### **18. Load Connection Section**

Large Phase and Neutral bars are arranged in separate compartment. Load cables are bolted to these bars. Provision is made for gland plate or extension duct in base of compartment. Facility available for earthing star point.

### **19. Batteries**

Battery box houses lead acid battery for diesel engine starting, auxiliaries and lighting is arranged along side engine adjacent to starter motor. The battery bank is capable of 3x3 start attempts.

### **20. Battery Charging**


Engine driven alternator is provided, there is also added a solid state battery charger.

### **21. Change-over Panel**

#### A. C. Section

Supply from external power supply, generator set or "off" may be selected. Panel distributes power to:-

Container  
Lights (AC)  
Battery Charger  
Engine Coolant Heater

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AC Socket Outlet

D. C. Section

Supply from batteries distributed to :-


Container Lights (DC) (disconnected and removed)

**22. Emergency Stop**

Recessed Buttons on outside of container adjacent to personnel access doors.

**23. Options**

Fuel fill shut-off switch (Germany)  
Reserve L.O. tank with automatic top-up  
Battery Charger (Included)  
3 pole UL Approved Circuit Breaker  
Earth Leakage Protection (Included)  
Automatic Synchroniser  
Lifting Certificate (Included)  
2 Speed Fan

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## Fuel level datasheet

Fuel level control			
W-08-EG01(D)			
1	Make	Ref	Siemens
2	Model	Ref	Sitrans P
3	Quantity		1
4	Type	7MF4032-1BA10-1BB1	
5	Serial nr.	N1K227-94156	
6	MeBspanne	0,03....1bar	
7	Oberlastgrensen	-1..... .6bar	
8	E Ex ia IIC T6		
9	$U_0 \leq 30V$ ; $I_k \leq 10mA$ ; $P \leq 0,75W$ ; $C_i \leq 8nf$ ; $L_i \leq 0,6mH$		
10	PTB Nr.	Ex-94.C2090	
11	FW Nr.	11.04	
12	For further info see PDF file ( <a href="#">sec_01druck.pdf</a> )		

## Application

The transmitter measures the pressure of corrosive and non-corrosive

gases, vapors and liquids. Different spans are possible depending on the version.

The output signal is a load-independent direct current of 4 to 20 mA linearly proportional to the input pressure, or a digital bus

signal. Transmitters conforming to the type of protection "Intrinsic

safety" and "Explosion-proof" may be installed within potentially

explosive atmospheres (zone 1). The conformity certificate corresponds to the European standard (CENELEC), the American standard (FM) or the Canadian standard (CSA).

The transmitters can be equipped with various designs of remote


seals for special applications such as the measurement of highly viscous substances.

### Adjustable spans

### Process pressure limits

### Types of protection and conformity certificates

For further info see PDF file ( [sec\\_01druck.pdf](#) )

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## Exhaust temp measurement/trip datasheet

### Exhaust temp Sensor


Sensor	Type	Function
INOR	TRA-R6X	PT100

### Exhaust temp relay

KFD2-GU-Ex1

- 1-channel
- EEx ia IIC input
- 2 switch outputs
- Optional high or low alarm
- Adjustable operating modes
- Settings:
  - 0 ... 10 V, 0 ... 20 mA
  - Pt 100, Ni 100
  - Thermocouple models  
(B, E, J, K, L, N, R, S or T)
  - internal/external cold junction compensation
  - Sensor monitoring with thermocouples
  - Sensor monitoring and lead short circuit monitoring for Pt 100, current and voltage
  - Online adjustment via serial interface to the PC.

For relay see PDF file [kfd2](#)

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## Inergen Fire extinguisher System

- The volum of free space in engine compartment is 16,624 m<sup>3</sup> (this volume is the volume of the compartment that the inergen is released to).

<b>Inergen Fire extinguishing system</b>		
1	TAG NUMBER	W-72-SH02
2	AREA	BACK-UP GENERATOR ENGINE ROM W-08-EZ01
3	LOCATION	C30W
4	AREA VOLUME GROSS (m <sup>3</sup> )	39,3
5	AREA VOLUME NET (m <sup>3</sup> )	16,624
6	HAZARD / PROTECTION	ELECTRICAL, GAS / EXTINGUISHMENTS
7	NO. OF ROOMS (OR ENCLOSURES)	1
8	CONCENTRATION BY VOLUME AT 20 <sup>0</sup> C	50%
9	TIME TO REACH CONCENTRATION	30 SEC
10	CALCULATED DISCHARGE TIME	N/A
11	TIME TO MAINTAIN CONCENTRATION	15 min
12	SYSTEM ACTUATION	AUTOMATIC
13	OPERATING VOLTAGE	24V DC
14	NO. OF CYLINDERS MAIN FILLING	1
15	NO. OF CYLINDERS EXTENDED FILLING	0
16	VOLUME CYLINDER (LTR.)	50
17	PRESSURE CYLINDER (BAR)	200
18	WEIGHT OF BANK (GROSS)	370 kg
19	LOCATION OF INERGEN BANK	OUTSIDE DIESEL/GENERATOR ROOM
20	REFERENCE DRAWING	C034-B-C30W-PW-2120.01
21	FIRE PROTECTION DATA SHEET	C034-B-S-DY-C365



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## Circuit breaker W-08-EF01

1	Ampere frame	2500
2	Type	AT25
3	Number of poles	4
4	Rated current (A) (In)	2500
5	Neutral pole ampere frame (A)	2500
6	Rated primary current trip	250
7	Devises (ICT) (A)	500
8	Rated current of over current trip devises (I0) (A)	$125 \leq I_0 \leq 250$
9	Rated impulse withstand voltage (Uimp) (kV)	8
10	AC Rated insulation voltage (Ui) (V) IEC947-2	1000
11	Rated operational voltage (Ue) (V)	690
12	AC Rated break cap. (kA r.m.s.) MAKE CAP. (kA peak)	
13	IEC947-2 With Inst	690V 50/105
14	BS EN 60947-2	600V 50/105
15	CEI EN 60947-2	500V 65/143 up to 415V 65/143
16	Without Inst / with MCR	690V 50/105
17	Without Inst / with MCR	600V 50/105
18	Without Inst / with MCR	up to 500V 65/143
19	Short time withstand Current (Icw) (kA)	<u>1 sec</u> 65 <u>3 sec</u> 50
20	Latching current (kA)	50
21	Utilisation category	B
22	Operation times	
	Total Breaking time (s)	0,05
	Spring charging time (s) max.	10
	Closing time (s) max.	0,06

### OCR Specification Multi-function protection device

23	Protection Functions	Setting Range	Actual
24	BASE current (Io) (A)	(In) x (0,63-0,8-1)	0,63
25	LTD Pick – up current (I1) (A) Time delay (T1) (s) Setting tolerance	(Io) x (0,8-0,85-0,9-0,95-1,0-1,05-1,1-NON) (0,5-1,25-2,5-5-10-15-20-25-30) at (I1)600% + - 15%	0,9 20
26	STD Pick-up current (I2) (A) Setting tolerance Time Delay (T2) (ms)	(Io) x (1-1,5-2-2,5-3-4-6-8-10-NON) + - 15% (80-160-240-320-400-480-560-640-800-1000)	3 240
27	INST Pick-up current (I3) (A) Setting tolerance	(Io) x (2-4-6-8-10-14-16-NON) + - 20%	8



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## Earth Fault relay

1	Earth fault relay Bender type: RCM 470 LY 230VAC Earth fault transformer Bender type: WO-S15		
2		Setting area	Actual
3	Current range	10mA – 10A adjustable	4A
4	Timer range	0 – 10 sec adjustable	1sec
5	Multiplier	Transformer C788-944 500/5A wrapped twice	100A
6	Actual real fact setting	400A 1sec	

