

SUPPLY OF DIGITAL MICROPROCESSOR BASED MULTIFUNCTION STATIC RELAYS FOR  
PROTECTION OF MOTORS AND TRANSFORMERS FOR DAKHNI GAS PROCESSING PLANT.

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	<b>OIL &amp; GAS DEVELOPMENT COMPANY LIMITED</b>		
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Document		BOQ FOR SUPPLY OF DIGITAL MICROPROCESSOR BASED MULTIFUNCTION STATIC PROTECTION RELAYS FOR MOTORS AND TRANSFORMERS FOR DAKHNI GAS PROCESSING PLANT.	Sheets
Document #	Dkn-4917/BOQ/01	<b>Attachment for Indent DKN-4917</b>	14

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S/No	Description	Specified	Offered (To be filled by Vendor)
1	<b>General</b>		
1.1	Application.	Motor & Transformer Feeder Protection	
1.2	Reference data.	<ul style="list-style-type: none"> <li>-This Document</li> <li>- Single Line Diagram shall be provided on demand</li> <li>- Schematics &amp; Wiring Diagram shall be provided on demand</li> <li>- Switchboard &amp; Relay Snapshots shall be provided on demand</li> <li>- Existing Relay Catalogues shall be provided on demand</li> </ul>	
1.3	Standards.	<ul style="list-style-type: none"> <li>- IEC 60255</li> <li>- Applicable IEC/ANSI standards</li> </ul>	
1.4	Applicable Documents	<ul style="list-style-type: none"> <li>- Factory test certificates.</li> <li>- Schematics &amp; Wiring Diagram</li> <li>- FAT procedure documents</li> <li>- All applicable as per standards.</li> </ul>	
1.5	Documentation required with quotation.	<ul style="list-style-type: none"> <li>- This BOQ with vendor response on all items individually.</li> <li>- Technical Data of the items offered.</li> <li>- Price Schedule of each item &amp; services offered as per SOR.</li> </ul>	
1.6	Project Documentation.	<ul style="list-style-type: none"> <li>-As Built documents, hard and soft copies; catalogues;</li> <li>Reports of inspections, tests, settings, commissioning.</li> <li>Software shall be provided for system configuration.</li> </ul>	
1.7	Delivery Schedule	-As per SOR.	

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**EXISTING RELAYS TO BE REPLACED WITH NEW DIGITAL RELAYS & SWITCHGEAR MODIFICATION**

S/No	Parameter		Specified	Offered make & model (To be filled by Vendor)
<b>2</b>	<b>EXISTING RELAYS TO BE REPLACED</b>			
	Description	Rating	Current	Existing Relay
2.1	Air Cond. Package PA-501 CT Ratio: 50/5 Relay No: 045834W	336KW	39A	CTM 42 DF2AJ1452L
2.2	Air Blower(S.R.U) GA-701B CT Ratio: 50/5 Relay No: 045841W	187KW	23A	CTM 42 DF2AJ1452L
2.3	Air Blower(S.R.U) GB-701A CT Ratio: 30/5 Relay No: 045836W	187KW	23A	CTM 42 DF2AJ1452L
2.4	Lean Amine Pump GA-403-A CT Ratio: 100/5 Relay No: 045840W	755KW	89A	CTM 42 DF2AJ1452L
2.5	Lean Amine Pump GA-403-B CT Ratio: 100/5 Relay No: 045837W	755KW	89A	CTM 42 DF2AJ1452L
2.6	Hot Oil Pump 830-GA-01A CT Ratio: 30/5 Relay No: 045838W	155KW	22A	CTM 42 DF2AJ1452L
2.7	Hot Oil Pump 830-GA-01B CT Ratio: 30/5 Relay No: 045839W	155KW	22A	CTM 42 DF2AJ1452L
2.8	Hot Oil Pump 830-GA-01C CT Ratio: 30/5 Relay No: 045839W	155KW	22A	CTM 42 DF2AJ1452L
2.9	Fire Water Pump 901-GA-01A CT Ratio: 30/5 Relay No: 045833W	220KW	27A	CTM 41 DF2AJ1452L
2.10	TRANSFORMER 1 CT Ratio 200/5	2000KVA	192.45	CDG 61/SPEC8FF98G
2.11	TRANSFORMER 2 CT Ratio 200/5	2000KVA	192.45	CDG 61/SPEC8FF98G
2.12	TRANSFORMER 4 CT Ratio 200/5	2000KVA	192.45	CDG 61/SPEC8FF98G

**Digital Motor Protection Relays Qty = 9**  
**Digital Transformer Protection Relays Qty = 3**

[1 x CTM41 + 8 x CTM42 + 3 x CDG61 relays shall be replaced]

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**BOQ: NEW DIGITAL RELAYS & SWITCHGEAR MODIFICATION**

S/No	Parameter	Specified	Offered (To be filled by Vendor)
<b>3</b>	<b>Technical</b>		
<b><u>A</u></b>	<b>Motor Protection Relays: (Required quantity = 09 Nos.)</b>	VTS = Vendor To Specify	
3.1	Make	VTS	
3.2	Model	VTS	
3.3	Thermal (Th) Protection	Required	
3.4	Instantaneous three phase overcurrent (I1) Protection	Required	
3.5	Instantaneous unbalance & single phasing (I2) Protection	Required	
3.6	Instantaneous earth fault (I0) Protection	Required	
3.7	RTD Functionality	Required	
3.8	No. of RTD Inputs	VTS as per existing schematics	
3.9	Measurement Functionality (Voltage, Current)	Required	
3.10	Communication protocol	Required	
3.11	AC Current Inputs	Required	
3.12	Power Supply	Control Supply= 110VDC ; Aux. Supply= 220/230VAC	
3.13	Contacts	Required	
3.14	Frequency	50 Hz	
3.15	Operating Temperature	Ambient 50 deg C	
<b><u>B</u></b>	<b>Transformer Protection: (Required quantity = 03 Nos.)</b>		
3.16	Make	VTS	
3.17	Model	VTS	
3.18	IDMT Overcurrent and Earth fault Protection	Required	
3.19	Measurement Functionality (Voltage, Current)	Required	
3.20	Communication protocol	Required	
3.21	AC Current Inputs	Required	
3.22	Power Supply	Control Supply= 110VDC ; Aux. Supply= 220/230VAC	
3.23	Contacts	Required	
3.24	Frequency	50 Hz	
3.25	Operating Temperature	Ambient 50 deg C	

## **0- SYSTEM DETAILS**

The Electrical power systems at various utilization voltages are as follow:

Medium Voltages (MV)            6kV, 3 Phase, 3 Wire, 50Hz, resistance earthed

Low Voltage (LV)                0.4kV, 3 phase, 4 Wire, 50Hz, neutral solidly earthed

- 800A, 6kV medium voltage Bus bar
- Gas Turbines Generators            = 3 Nos. (5MW + 2.5 MW + 2.5MW)
- Distribution transformer feeders    = 4 Nos. (Including 1 Spare)
- MV motor feeders                    = 12 Nos.

Installed Relays:

- Generator Incomer Relays            = 3 x 7UM62
- Motor Feeder Relays                 = 3 x P225 + 8 x CTM42 + 1 x CTM41
- Transformer Feeder Relays          = 3 x CDG61 + 1 x P115

SUPPLY OF DIGITAL MICROPROCESSOR BASED MULTIFUNCTION STATIC RELAYS FOR  
PROTECTION OF MOTORS AND TRANSFORMERS FOR DAKHNI GAS PROCESSING PLANT.

**SCOPE OF SERVICES FOR INSTALLATION, COMMISSIONING & TESTING OF NEW DIGITAL RELAYS AND SWITCHGEAR MODIFICATION**

S#	DESCRIPTION	Specified	Offered (To be filled by Vendor)
<u>4</u>	<b>Scope of Services</b>		
4.1	<p>Modification works in the existing installed 6kV MV panel shall include but not limited to;</p> <ul style="list-style-type: none"> <li>- Physical removal and handing over of installed relays to OGDCL site team.</li> <li>- Installation of new digital relays.</li> <li>- Supply of Control Supply (110VDC) &amp; Aux. Supply (220/230VAC) from existing system to new relays.</li> <li>- Internal wiring, lugs, connectors, MCBs, power &amp; control terminals, ferrules, nuts, bolts, lugs etc.</li> <li>- Cutting/modifications in the panel door for the installation of new relays shall be complete in all respects.</li> <li>- Site visit for assesment of panel existing metering and protection devices.</li> <li>- It is the responsibility of the supplier/vendor/contractor to conduct a site visit and acquire data itself for replacement of old relay and installation of new digital relays on the same cubical / panel door. All material will be arranged by the supplier / contractor.</li> </ul>	Required	
4.2	Wiring diagrams for proposed digital protection relays	Required	
4.3	Testing, Pre-Commissioning, Commissioning, Setting of parameters, Performance testing etc	Required	
4.4	Warranties	Required	
4.5	Factory or Site Acceptance Tests	Required	
4.6	Onsite training of O & M team for digital protection relays	Required	
4.7	As Built Documents and Software.	Required	

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SPECIMEN FOR PRICE SHEDULE

<b>S.No.</b>	<b>DESCRIPTION</b>	<b>QUANTITY (Nos.)</b>	<b>PRICE (PKR)</b>
1	SUPPLY OF NEW DIGITAL MICRO PROCESSOR BASED MULTY FUNCTION STATIC RELAYS FOR PROTECTION OF MOTORS ALONGWITH DESIGN, INSTALLATION, COMMISSIONNG, TESTING, REMOVAL OF EXISTING RELAYS AND SWICHGEAR MODIFICATION.	09	
2	SUPPLY OF NEW DIGITAL MICRO PROCESSOR BASED MULTY FUNCTION STATIC RELAYS FOR PROTECTION OF TRANSFORMERS ALONGWITH DESIGN, INSTALLATION, COMMISSIONNG, TESTING, REMOVAL OF EXISTING RELAYS AND SWICHGEAR MODIFICATION	03	

SUPPLY OF DIGITAL MICROPROCESSOR BASED MULTIFUNCTION STATIC RELAYS FOR  
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**SUBJECT: TOR FOR THE SUPPLY OF DIGITAL MICROPROCESSOR BASED MULTIFUNCTION STATIC RELAYS FOR PROTECTION OF MOTORS AND TRANSFORMERS FOR DAKHNI GAS PROCESSING PLANT.**

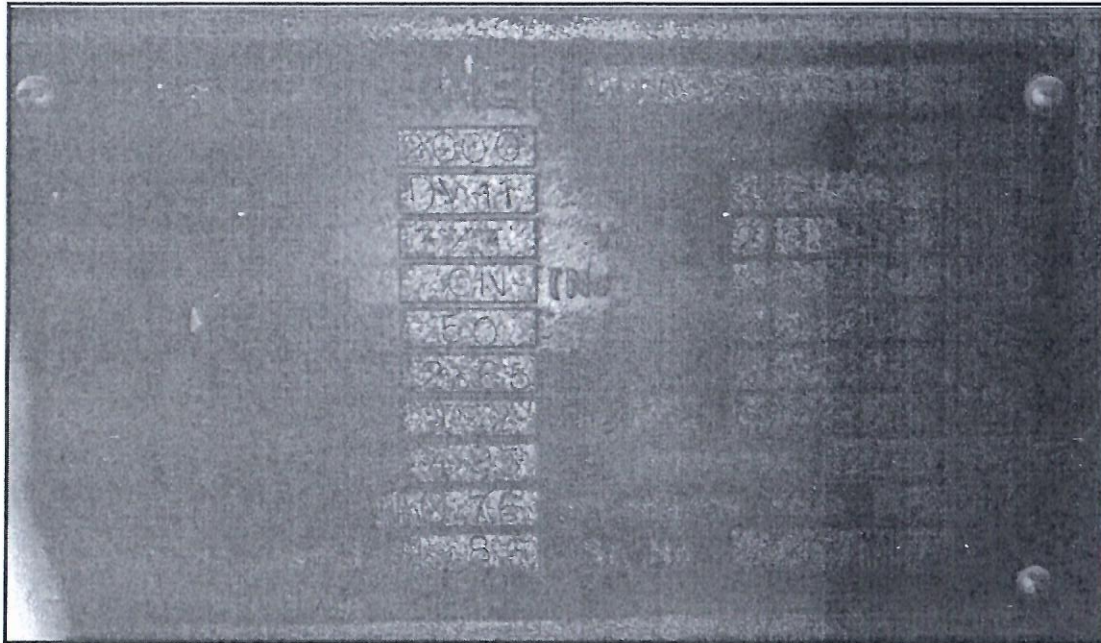
1. The bidder shall be an OEM (Original Equipment Manufacturer). The quotation must include manufacturer name and country of origin.
2. The relays shall be from reputable brands preferably American & European origin.
3. The OEM shall have at least 10 years of successful working history in the Pakistani market.
4. The bidder shall completely fill the response against each item mentioned in BOQ.
5. The project shall be executed on fast track basis during the forthcoming annual turnaround of OGDCL Dakhni plant probably in the month of March, 2019.
6. All existing protection, control & metering interfaces shall be retained.
7. Relay coordination study shall be provided by OGDCL through its consultant which will include protection settings only.
8. The Relay configuration/parameterization files shall be prepared and uploaded in the Relay by the vendor.
9. It is the responsibility of the supplier / vendor to conduct a site visit and acquire/verify all the required data itself for replacement of relays in the same panel and therefore pre bid visit is mandatory.
10. The supply cost should include the supply of relays and other related materials necessary for satisfactory installation of new digital relays alongwith services for installation, commissioning and testing (up to the level of satisfaction of OGDCL & Engineering consultant).
11. The Supplier shall provide the installation, operation and maintenance manuals of the offered system.
12. All wiring shall be properly dressed.
13. Existing System: Control Supply= 110VDC ; Aux. Supply= 220/230VAC
14. The Supplier shall specify the delivery period in its proposal.
15. It is the responsibility of Supplier to transport the equipment safely at site.
16. The successful bidder shall provide all the drawings & documents for approval to OGDCL/engineering consultant.
17. The successful bidder shall provide wiring diagrams, component list, method statement, and cut-over plan etc., prior to start any work at the site.
18. The contractor will provide 03 sets of as-built drawings to OGDCL/engineering consultant in addition to those supplied and shipped with the equipment in the document/material case.
19. Licensed Software of digital protection relays will also be provided to OGDCL site team on the suitable device for future use.
20. The supplier shall guarantee that equipment is free from fault and fulfill required / specified operating conditions. Should any defect in relay developed during guarantee period in operation, the supplier shall provide new relay in replacement of defective equipment/component at his own cost including transportation, testing and installation. Repaired equipment will not be accepted at all.

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### 7.2 Transformers Data

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ID	T-3
kVA	630
HV	6000
LV	400
HV Amps	60.62
LV Amps	909.3
Impedance Volts	4.0 % (Assumed for this transformer size as per IEC)
Cooling	ONAN



*Handwritten signature*

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8.1 Motors Data

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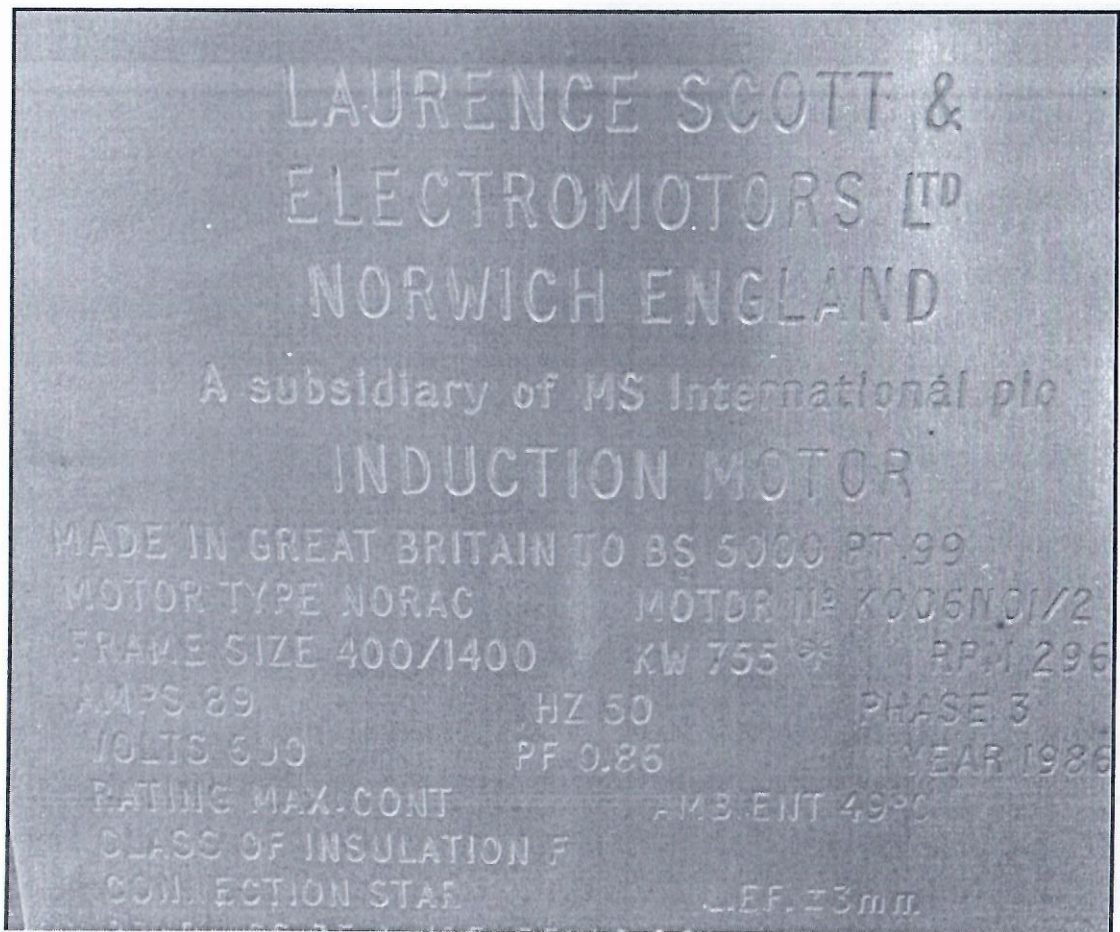
<b>ID</b>	830-GA-01 A/B/C
<b>kW</b>	187
<b>Voltage</b>	6000
<b>FLA</b>	21.5
<b>Power Factor</b>	0.87
<b>Service Factor</b>	1.15

*Wheeler*

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8.2 Motors Data

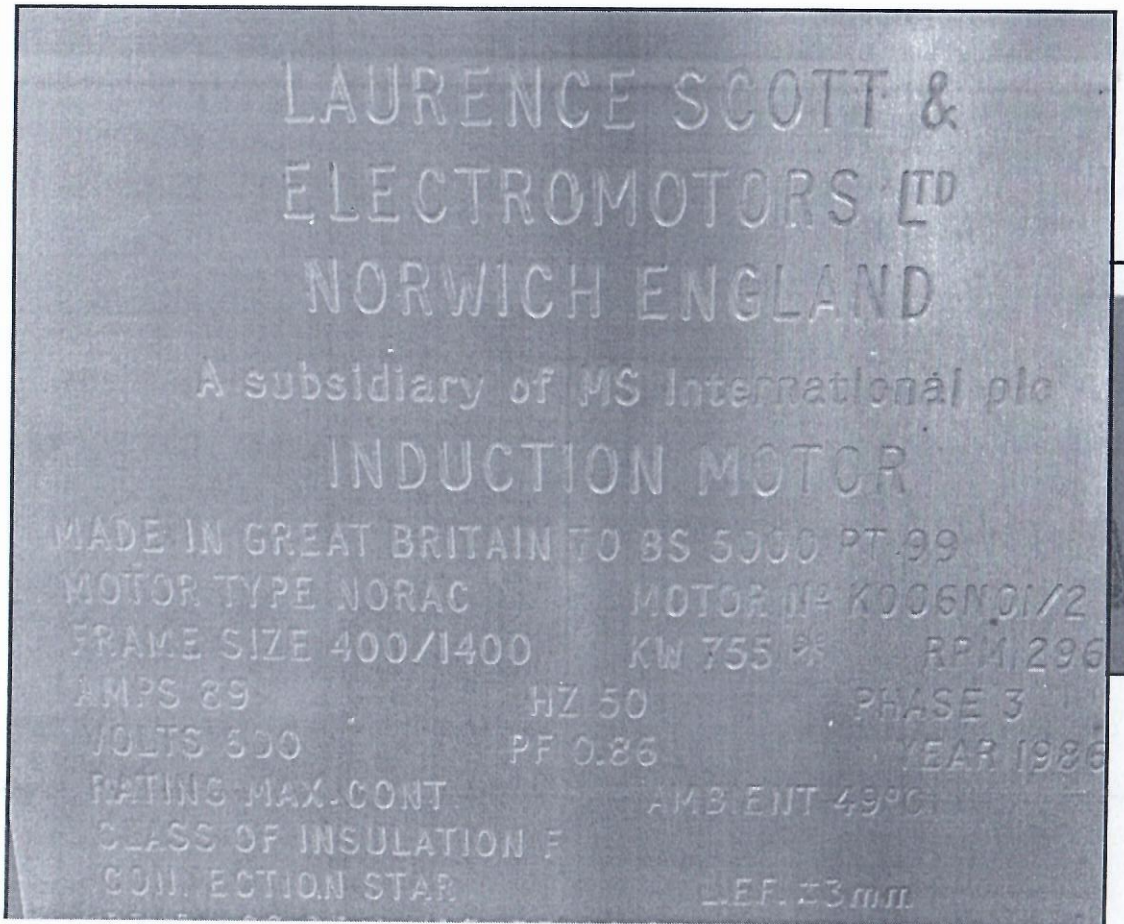
<b>ID</b>	GA-403-A/B
<b>kW</b>	755
<b>Voltage</b>	6000
<b>FLA</b>	89
<b>Power Factor</b>	0.86
<b>RPM</b>	2965
<b>Service Factor</b>	1.15



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8.3 Motors Data

ID	K-9851/RSC
kW	975
Voltage	6000
FLA	107
Power Factor	0.91
RPM	2989



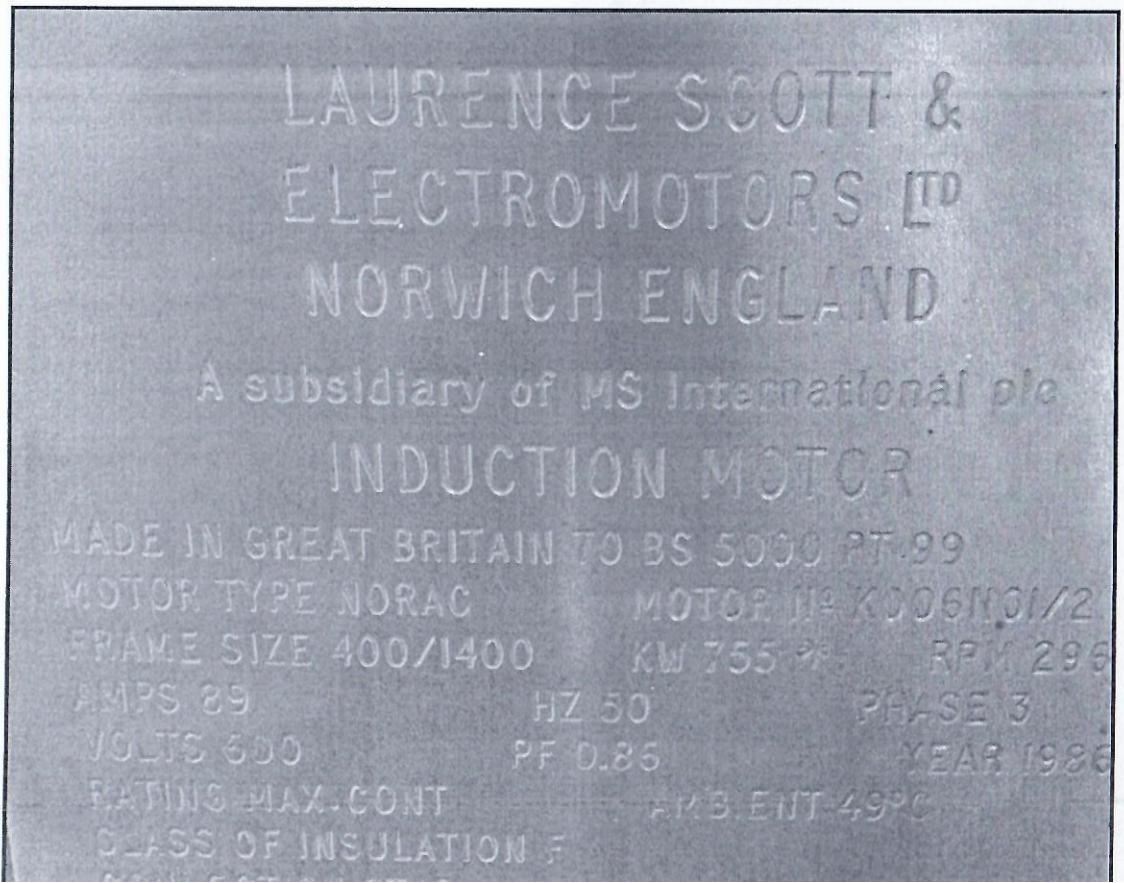
*W. M. ...*

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8.4 Motors Data

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<b>ID</b>	830-GB-701-A/B
<b>HP</b>	250
<b>Voltage</b>	6000
<b>FLA</b>	23
<b>Power Factor</b>	Standard Manufacturer Value Considered
<b>RPM</b>	1485
<b>Service Factor</b>	1.0



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*Wm*

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8.5 Motors Data

<b>ID</b>	C-1901-AB
<b>kW</b>	250
<b>Voltage</b>	6000
<b>FLA</b>	27.6
<b>Power Factor</b>	0.92
<b>RPM</b>	2975
<b>Service Factor</b>	1.15

LAURENCE SCOTT &  
ELECTROMOTORS LTD  
NORWICH ENGLAND  
A subsidiary of MS International plc  
INDUCTION MOTOR  
MADE IN GREAT BRITAIN TO BS 5000 PT. 99  
MOTOR TYPE NORAC MOTOR N° K006N01/2  
FRAME SIZE 400/1400 KW 755 \* RPM 296  
AMPS 89 HZ 50 PHASE 3  
VOLTS 600 PF 0.86 YEAR 1986  
RATING MAX. CONT AMB. ENT 49°C  
CLASS OF INSULATION F  
CONNECTION STAR L.E.F. 23mm

*Volere*