	COMPARATIVE STATEMENT FOR PROJECT:193186-INTRODUCTION OF A GPI WANA SOUTH DATE OF TENDER OP	H WA	ZIRI	STA	AN		DLO	GIES	IN	POLYTECHNIC II	NST	ITUT	ΓES	OF	FAT	ΓΑ		
	ELECTRICAL TE	CHN	OLO	GΥ														
ltem No.	Name of Items		Ele	ctri	cal Eng	gine	eerin	ng Se	ervio	ces, Lahore			1	AI-V	Vaqa	as A	ssocia	ate, Lahore
NO.		c	.s		P.C		P.L.I	P	т	Model	C	.s	F	P.C		P.L.F) Т	Model
		40	1	5					60		40			2			4 60	
	With integrated DC, AC and three - phase current sources as well as a function generator. Function generator, DC and three-phase current sources short-circuit proof and LED-monitored. The out signals of the voltage generator can be adjusted with a PC via built in USB-connection and the operators software. These signals can be simultaneously projected with a beamer offers a universal training and instruction system perfectly suitable for conducting following experiments: DC, AC and three-phase current technology Characteristics of diodes and transistors Characteristics of thyristors and triacs Amplifier circuits									8.11.1+V0101- GB+V0102- GB+V0103- GB+V0104- GB+PCSU1000+ 9102.13-3 HPS GERMANY Complete								V0101-GB+V0102- GB+V0103- GB+V0104- GB+PCSU1000+910 .13-3 HPS GERMAN
	Oscillator circuits Modulators and demodulators Multivibrators Power supply circuits Switched power supplies and DC voltage converters Power electronic circuits With measuring interface incl. measuring									Brushar not Provided								
	Software the measured data are easily shown on a PC-monitor. With the USB-Oscilloscope student can view all signals time or frequency based. Technical Features: AC and DC voltages - DC voltage: +15 V (± 5 %); 800 mA - 15 V (± 5 %); 800 mA + 5 V; 100 mA																	
	0 25 V; 300 mA - AC voltage: 24 V AC; max. 100 mA Function generator - Sinewave / Squarewave / Triangle: V = 0 ~ 20 V; 100 mA F = 1 Hz 250 kHz																	
	- Squarewave, positive: V = 5 V / TTL - PWM 10 kHz; Pulse width 0 100 % - DC Offset +12 V12 V Three-phase current generator																	

	 Phase voltage: 7 VAC Line voltage: 12 VAC Line current: max. 50 mA Frequency: approx. 50 Hz The outputs of the function generator, DC and three-phase current sources are short-circuit-proof and LED-monitored. Digital 2-channel storage oscilloscope with USB interface, max. sampling rate: 1 GS/s, spectrum analyzer, transient recorder, incl. 2 test probes, USB interface cable, software, manual for operating systems: Windows 98 SE or higher Set of connections: 70 connecting plugs, 2 mm/5 mm 6 connecting leads, 2 mm, 30 cm 															
	2 connecting leads, 2 mm, 50 cm Experiment manual with CD: Direct Current Technology Alternating Current Technology Semiconductor Components Basic Electronic Circuits															
2	Basic Electronic Circuits UK, Germany or Equivalent BASIC ELECTRICITY TRAINING KIT Universal training and instruction system 1019 for non-electrical professions. With integrated DC and AC sources. All functions are short-circuit-proof and monitored by LEDs. Clear arrangement of accessories directly on the basic unit. Detailed instructions for experiments with solutions. Components protected against incorrect connection It contains numerous experiments with solutions. Components protected against incorrect connection It contains numerous experiments with problems and solutions for the following subjects (excerpt): The electrical circuit - Ohm's law Electric measuring equipment - Electric reasuring equipment - Electric resistors - Resistors in parallel - Voltage sources in parallel - Voltage sources in parallel - Capacitor - Voltage sources in parallel - Capacitor - Diode - LED - Transistor as a switch + Half-wave rectifier - Logic circuits CED C and AC voltages saviable on the Board - DC voltage and current: 14 V (rms); 0.1 A The outputs of both voltage sources are short-circuit-proof and monitored by LEDs. Relay	40	0	5	0	4	4 5	1019+V0106- GB+PCSU1000+ 9102.13-3 HPS GERMANY	40	0	5	0	4	4	53	1019+V0106- GB+PCSU1000+9102 .13-3 HPS GERMANY

- Contacts: 2 changeovers													
- Contact power: max. 1 A													
- Operating voltage: 15 V DC													
The individual electric components are connected by 4 mm safety jacks with 4 mm plugs or leads.													
Digital 2-channel storage oscilloscope with USB interface, max. sampling rate: 1 GS/s, spectrum analyzer, transient													
recorder, incl. 2 test probes, USB interface cable, software, manual for operating systems: Windows 98 SE or higher													
Experiment manual: Fundamentals of Electrical Engineering													
	40 0	-	0			52	2010 2010 1	40 0	-			50	2010, 2010 1
3 DIGITAL ELECTRONICS TRAINER	40 0	5	0	4	4	53	3910+3910.1-	40 0	5	0 4	4	53	3910+3910.1-
Universal training and exercise unit 3910 for fundamental digital technology/microcomputer technology. The DIGI BOARD	,						1+V0160-GB						1+V0160-GB
2 contains all function groups and the power supply for fast experiment setup. Can be used as a desktop, demonstration							HPS						HPS
or portable training unit. Individual expansion possibilities. With an adapter for connection to a computer							GERMANY						GERMANY
Features:													
2 input keys with 4 pairs of keys (L/H) each													
- Clock generator with divider, TTL level, crystal-													
controlled													
- DC signal source 05 V/10 mA													
- Hexadecimal/dual coding switch (double)													
- LED display, divided into 3 groups with the colours													
red, yellow, green													
- HIGH/LOW, for tapping HIGH, LOW states													
- 7-segment display (2-digit), with decoder													
- Adapter (2 mm jacks/ SUB-D socket), for adapting													
2 mm jacks to SUB-D connector (25-pin), pins													
113 and 18 assigned													
- 8 AND gates, with pull-up resistors, one of which is													
disconnectable													
- 6 OR gates, with pull-down resistors, one of which is disconnectable													
- 3 AND/OR combi-gates - 1-bit comparator													
4-bit comparator													
- 4 JK-flip flops, can also be used as RS flip flops													
- 4 D-type flip flops													
- 2 adders (4-bit), with input and output carry													
- Mono flop, settable times: 0.1 s; 1 s; 5 s													
- Multiplexer, 4 channels													
- Demultiplexer, 4 channels													
- Shift register (4-bit), parallel and serial operation													
possible, bidirectional													
- ALU, for conducting 16 arithmetic and 16 logical													
computing operations with 4-bit dual numbers													
- Binary counter (4-bit), up/down counter													
- 2 inverters with open collector (pull-up resistors													
can be connected)													
- 2 Schmitt triggers, inverting													
- Units complements for negating a 4-bit binary													
number													
- Antivalence and equivalence gates													
- RAM 8x4, static RAM,													
8 addresses, 4 bits data Width													
Basic logical circuits													
- Schmitt triggers													
- Bistableflipflops													
- Monostableflipflops				1	I						I		

	· ····································												
	- Code converters, coders												
	- Computing circuits												
	- Counting circuits												
	- Register circuits												
	- Multiplex mode												
	- ALU												
	- Memory circuits												
	- Analog-digital converter,												
	- Digital-analog converter												
	Technical Data:												
	Integrated power supply for additional plug-in modules												
	5 V DC/max. 1 A; the power is supplied via the plugs in the base of the modules.												
	DC voltage source +5 V/0.5 A												
	For connecting external equipment IC components												
	All IC components are inserted in sockets.												
	Connection Leads:												
	22 connecting leads, 2 mm, 7.5 cm												
	12 connecting leads, 2 mm, 20 cm												
	12 connecting leads, 2 mm, 30 cm												
	14 connecting leads, 2 mm, 50 cm												
	8 connecting plugs, 2 mm												
	Experiment manual with CD												
	Experiments in Digital Technology												
4	AM TRANSMITTER AND RECEIVER TRAINER and FM TRANSMITTER AND RECEIVER TRAINER	40	0	5	0	4	4	53 4070+4070.1+40	40 0	5	0	4	4 53 4070+4070.1+4070.2
-	Complete radio trainer in one Board 4070. All the important signals tappable at measuring points. With built-in AM and	40	0	5	0	4	4		40 0	Э	0	4	
	FM tuner. With stereo decoder and integrated loudspeakers. With built-in sinewave generator							70.2+PCSU1000					+PCSU1000+9102.13
	Experiment with the Tone Control							+9102.13-3					3
	_ Experiments with the AM							HPS					HPS
	- Generation of an AM Signal with the							GERMANY					GERMANY
	FM/AM Transmitter												
	- Measuring the AM Antenna Signal												
	- Determination of the Oscillator Frequency												
	- Measurements at the AM Mixer												
	- Measurements at the IF Stage and at the												
	Demodulator												
	- Automatic Gain Control AGC												
	The FM/AM Transmitter is a module for generation of												
	a FM and AM signal.												
	Technical data												
	- Modulation input:												
	700 mV												
	- Modulation output:												
	AM signal: carrier 1 MHz												
	FM signal: carrier 100 MHz												
	- Supply voltage:9 V DC												
	AM unit												
	- Ferrite antenna at the input circuit												

- Frequency range: 540 1600 kHz, tunable by LC input circuit, consisting of capacitance diodes - HF amplifier			
- Oscillator for generating the IF frequency by means of a mixer, oscillator frequency: approx.			
900 Hz 2 MHz			
- IF circuit with filter (455 kHz), IF amplifier and AGC			
Sound adjuster			
- 2 inputs: right channel / left channel			
- Adjustable: volume, treble, bass and balance			
2 AF amplifiers			
- Output power: 3 W			
Sinewave generator			
- 5 frequency ranges: 300 Hz 34 kHz, adjustable			
- Output voltage: Vpp = 400 mV			
Complete radio trainer in one Board. All the important signals tappable at measuring points. With built-in AM and FM			
tuner. With stereo decoder and integrated loudspeakers. With built-in sinewave generator			
Experiments with the FM			
- Measuring the Adjustable Oscillator Frequency			
- Measurements in the IF Stage			
- Measuring at the Demodulator Output with Mono Reception			
- Measuring at the Demodulator Output at Stereo Reception			
- Measurements in the Stereo Decoder			
- Behaviour with and without DE-Emphasis			
The FM/AM Transmitter is a module for generation of			
a FM and AM signal.			
Technical data			
- Modulation input:			
700 mV			
- Modulation output:			
AM signal: carrier 1 MHz			
FM signal: carrier 100 MHz			
- Supply voltage:9 V DC			
FM unit			
- Antenna input for throw antenna			
- Input circuit with LC element, tunable with capacitance diodes			
- Frequency range: 88108 MHz			
- HF amplifier			
- Oscillator for generating the IF frequency by means of a mixer			
- IF amplifier with level detector output			
- Demodulator for generating the MPX signal			
- PLL demodulator with mono/stereo switching and deemphasis			
inputs			
Sound adjuster			
- 2 inputs: right channel / left channel			
- Adjustable: volume, treble, bass and balance			
2 AF amplifiers			
- Output power: 3 W			
Sinewave generator			
- 5 frequency ranges: 300 Hz 34 kHz, adjustable			
- Output voltage: Upp = 400 mV			
PC Based Interface Unit:			
Digital 2-channel oscilloscope with USB interface, max. sampling rate: 1 GS/s, spectrum analyzer, transient recorder, incl. 2			
test probes, USB interface cable, software, manual for operating systems: Windows 98 SE or higher			

5	TRAINER FIBER OPTICS TRANSMISSION SYSTEM	40	0	5	0	3	4	52	4290+4291+429	40 0	5 0	2 4	51	4290+4291+4290.1+
	For plastic and glass fibres 4290. With built-in transmit diodes in different wavelengths of the light. Characteristic	40	0	5	0	5	4	52		40 0	5 0	2 4		
	recording and attenuation measurement								0.1+4282.20+42					4282.20+4282.21+42
	also possible with DC voltages. Coupling attenuations								82.21+4282.23+					82.23+4290.21+4290
	can be simulated directly on the Receiver Board. All necessary power supplies and generators on Board								4290.21+4290.2					.23+4290.30+9101.1
	Experiments on fibre optics with plastic fibre								3+4290.30+9101					+9120.18+9120.20_9
	- Characteristics of transmit diodes								.1+9120.18+912					120.21+9103.2-
	- Attenuation of plastic fibres and connectors								0.20_9120.21+91					YE+9103.4-
	- Transmission of TTL signals													
	- Immunity to interference of the optical fibre								03.2-YE+9103.4-					YE+V0134-GB
	- Experiments on optic fibre with glass fibre								YE+V0134-GB					HPS
	- Measurement of propagation time								HPS					GERMANY
	- Measurement of propagation time								GERMANY					Complete Brushar
	Optical Transmitter													not Provided
	Inputs (2 mm jacks)													
	- 1 analog / 1 digital													
	Optical outputs													
	- 660 nm / 850 nm (plastic fibre)													
	- 850 nm (glass fibre, ST-standard)													
	Electrical output (via 2 mm jacks)													
	- With preceding driver circuit for connecting a two-wire line or coaxial cable for comparative measurements on a fibre													
	optic transmission path													
	- Output impedance: 50 Ω; 75 Ω													
	Function groups													
	- Sinewave generator: F = 1 kHz; Vpp = 3 V													
	- Squarewave generator: $F = 10 \text{ kHz}$ (TTL)													
	- Pulse generator: impulse duration 400 ns													
	- Patch field and power supply for plug-in transformer to simulate Interferences													
	Optical Receiver													
	Optical input													
	- Plastic fibre / Glass fibre													
	Electrical input (2 mm jacks)													
	- For connecting a two-wire line or coaxial cable for comparative measurements													
	- Input impedance: 50 Ω ; 75 Ω													
	Output amplifier													
	- Voltage gain: 1 6 (adjustable)													
	- DC offset: +0,5 V5,5 V (adjustable)													
	Outputs (2 mm jacks)													
	- DC: Vout = 0 +/-8 V													
	- AC: Vout pp = 0 16 V													
	- TTL: with Schmitt trigger; fan-out = 10;													
	Set of accessories:													
	Plastic fibre, 0.5 m, without plug													
	Plastic fibre, 5 m, without plug													
	Plastic fibre, 20 m, without plug													
	Glass fibre, 1 m, with ST plug													
	Glass fibre, 20 m, with ST plug													
	Optical coupling for glass fibre													
	Connecting plug, 2 mm, spacing: 5 mm													
	Coil, N = 100													
	Coil, N = 900												1	
	Tape-wound core (1 pair)												1	
	Connecting lead, 2 mm, 30 cm, yellow													
	Connecting lead, 2 mm, 100 cm, yellow													
	Experiment manual with CD													
	Fibre optics													
	1	1	1	1	1		1		1		I	1	1	

6		40	0	г	^	А	А	г٦	E10E - E10E 1	40	^	E A	^	4	40	
6	BASIC POWER ELECTRONICS MODULE	40	0	5	0	4	4	53	5125+5125.1-	40	0	5 0	0	4	49	5125+5125.1-
	The whole power electronics on one Board 5125 With built-in three-phase source Connection field for Temperature and								1+V0121-							1+V0121-
	Brightness Controlled System								GB+PCSU1000+							GB+PCSU1000+9102
	All experiments with protective low voltage (12 V)								9102.13-3		1					.13-3
	Four-quadrant operation with H-circuit (MOS-FET) or anti parallel thyristor bridges Can be combined with PID BOARD, MOTOR BOARD and STEPPING BOARD								HPS GERMANY							HPS GERMANY
																Brushar not
	Experiments on the single-phase AC supply - The uncontrolled half-wave rectifier															
																Provided
	- The uncontrolled bridge rectifier															
	- The half-controlled bridge Rectifier - The fully controlled bridge rectifier															
	- The line-commutated inverter															
	- Two fully controlled bridge rectifiers, anti parallel with circulating current-free wiring and optical indication															
	by 2 LEDs															
	- Pulse group control															
	Experiments on the three-phase supply:															
	- The uncontrolled rectifier (M3)															
	- The uncontrolled rectifier (B6)															
	- The controlled rectifier (M3)										1					
	- The controlled rectifier (B6)															
	Experiments on the DC supply:															
	- Basic pulse width modulation (PWM) circuits															
	- PWM with H-circuit, DC-evaluated															
	- PWM with H-circuit, sine-evaluated															
	Contains resistive, inductive and capacitive loads for conducting the experiments mentioned above.															
	Bridgeable shunts are integrated in all the important															
	load current branches for measuring the currents.															
	The basic frequency of the PWM control can be varied															
	for investigation of the smoothing with uniform inductance.															
	Module connected to the single-phase mains, the required three phase voltage is generated internally.															
	Technical Data:															
	Integrated power supplies															
	- DC voltage: +/-15 VDC / 2.5 A															
	- AC voltage (L1): 12 V AC / 1 A															
	- Three-phase source: switchable for M3 or B6 circuit;															
	Vrms = 12 V DC															
	All power supplies are electrically isolated from each other.															
	Controls															
	- Phase gate control I, II and III															
	- Pulse group control															
	- Pulse width modulation															
	- Block-up logic for circulating current-free four-quadrant drive															
	- GTO pulse shaper															
	- Signal generator: f = 2 100 Hz (for sine-evaluated PWM) Rectifiers															
	- Uncontrolled rectifiers										1					
	- Controlled rectifiers (thyristors)															
	- H-circuit (Power MOS-FET)															
	Additional semiconductor components															
	- 1 diode, transistor, GTO thyristor, TRIAC															
	Load components															
	- Resistive load (27 Ω)															
	- Inductive load (20 mH)															
	- Capacitive load (47 μF)															
	PC Based Interface Unit:															
	Digital 2-channel oscilloscope with USB interface, max. sampling rate: 1 GS/s, spectrum analyzer, transient recorder, incl. 2															

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1	CONTROL OF INDUSTRIAL MOTORS TRAINING SYSTEM MODULE	40	0	5	0	4	4	53	5130+5125.5+V	40	0 5	0	0 4	49	5130+5125.5+V0122-
	Universal speed control system 5130. Extendable with plug-in module for temperature and brightness control								0122-GB						GB
	With integrated four-quadrant display								HPS						HPS
	With variable centrifugal mass								GERMANY						GERMANY
	.Dual-channel encoder														Brushar not
	Built-in four-quadrant Amplifier														Provided
	The module contains a machine set comprising:														Provided
	- DC motor with current actual value acquisition														
	- DC generator with connectable load														
	- Tacho generator with decoupling amplifier														
	- Connectable mechanical centrifugal mass, realized														
	electronically														
	- Dual-channel encoder for direct acquisition of speed														
	and direction of rotation														
	- Built-in sight window for optical recognition of														
	speed and direction of rotation and stroboscopic														
	scanning a four-quadrant indicator is integrated which links the current and direction of rotation via a logical circuit and														
	then indicates them on 4 LEDs.														
	The following disturbance variables can be applied:														
	- Variation of the mechanical centrifugal mass and														
	the related time constant fluctuation														
	- Connectable load on the Generator / Motor														
	- Rated voltage: 12 V														
	- Rated speed: 5900 / min														
	- Speed: max. 8000 / min - Current: max. 0.5 A														
	Generator - Rated voltage: 12 V														
	- Maximum current: 0.5 A														
	Tachogenerator														
	- Output voltage: 2 V@ 1000 / min decoupled by amplifier														
	RI = 200														
	Encoder														
	- Resolution: 100 lines / rev.														
	- Output channels: 2														
	- Output voltage: TTL (decoupled by TTL module)														
	Load														
	- Connectable load resistance: 33 / 5 W ; with parallel-circuited lamp														
	Current actual value acquisition														
	- Measuring resistance														
	Series-connected amplifier														
	- Gain factor: 10														
	- Internal resistance: 200														
	DC amplifier														
	- Input I: 0 +/-10 V														
	- Gain factor: V = 1.2														
	- Input II: 0 +/-5 V														
	- Gain factor: V = 2.4														
	- Output voltage in four-quadrant operation:														
	0 +/-12 V														
	- Output current: max. 0.5 A														
	Four-quadrant indicator														
							1	1	1				1 1		

•				-	•				100.1			•	0			100.1
8	MOTOR WINDING KIT MODULE	40	0	5	0	4	4	53	109.1	40	0	0	0	4	4 48	109.1
	Kit for instructions in design and assembly of three phase asynchronous induction motor SE2670 in four versions								ITALTEC							ITALTEC
	depending upon the kind of statoric winding that has been used.								ITALY							ITALY
	It includes magnetic circuits, insulating material, mechanical parts, to realise the motors															
	3PH 2 poles motor 0,5kVA - 230/400V, 50Hz;															
	3PH 4 poles motor 0,5kVA - 230/400V, 50Hz; 3PH 6 poles motor 0,75kVA - 230/400V, 50Hz;															
	3PH 8 poles motor 0,75kVA - 230/400V, 50Hz;															
	4 stator casing															
	4 squirrel cage rotor with shaft and bearings 8 shields															
	4 fan with housing															
	4 terminal block with terminal, related cover and fixtures															
	4 set of statoric winding of four different kind.															
	NOTE: Should be provided all the accessories including books etc.															
	LIK Germany or Equivalent															
9	EXPERIMENTER UNIT:	40	0	5	0	0	4	49	CO4203-2B	40	0	5	0	0	4 49	CO4203-2B
1	Experimenter SO4203-2B for coupling to the Experimenter modules.								LUCAS-NULLE							LUCAS-NULLE
	Connects to the UniTrain-I Interface and additional								GERMANY							GERMANY
	Experimenters via UniTrain-I bus															
	UniTrain-I bus connection for experiment cards															
	Direct connection to the standard UniTrain-I power															
	supply for use without an UniTrain-I Interface															
	Fixed and variable voltages available via 9 2-mm															
	sockets															
	Accommodates UniTrain-I experiment cards															
	Accommodates a breadboard for experimenting with															
	discrete components and integrated circuits															
	Accommodates a multimeter using IrDa interface															
	Dimensions: 28 x 19 x 9 cm															
	UK, Germany or Equivalent															
10	EXTENDED POWER SUPPLY	40	0	5	0	0	4	49	CO4203-	40	0	5	0	0	4 49 C	:O4203-2A+CO4203
	SO4203-2D Supplementary power supply unit for UniTrain-I system. This power supply unit is used in addition to the basic								2A+CO4203-2J							2J
	power supply unit where variable higher-power alternating voltages, adjustable higher-power direct voltages or a three-								LUCAS-NULLE							LUCAS-NULLE
	phase current system with variable frequencies and amplitudes are required for experiments. The UniTrain-I Interface is								GERMANY							GERMANY
	required for the power supply generation functions. Adjustment is carried out with virtual instruments.								_							
	Mains input: 100 - 250 V AC, 50 - 60 Hz via IEC socket (non-heated devices) and included mains cable															
	Output: 2 x 24 V / 2 A via cable approx. 2 m long with															
	6-pin DIN socket															
	Shunt resistors on a PCB SO4203-2J, for current measurement using the analog inputs of the UniTrain-I system. 6 Shunt resistors: 2 x 1 ohm. 2 x 10 ohm. 2 x 100															
	ohm Screen print of symbols for identifying resistors, the															
	voltage taps and current inputs															
	24 x 2-mm sockets															
	Dimensions: 100 x 40 mm															
	Set of connection cables 2mm (22 pcs) for UniTrain-I															
	consisting of:															
	8 x connection leads 2mm, 15cm, blue															
	4 x connection leads 2mm, 15cm, yellow															
	2 x connection leads 2mm, 45cm, black															
	2 x connection leads 2mm, 45cm, yellow															
	2 x connection leads 2mm, 45cm, red															
	2 x connection leads 2mm, 45cm, blue															
	2 x adapter connection leads 4mm to 2mm, 50cm,															
	E A daupter connection reads 4mm to Emm, socia,	1	1	1	I	I	1	I	i l	1	I I	ļ	1	1	1 1	I

	white	1				1	1	1		1						
ł																
ł	Connection plugs 2mm/5mm (10 pcs)															
ł	2-mm connector plugs															
I	Plug spacing 5 mm															
11	MOTOR-GENERATOR SET MODULE	40	0	5	0	0	4	49	2701 HPS	40	0	5 ()	4	4 53	2701
ł	Shunt-Wound DC Machine								GERMANY							HPS
1	Power: 0.3 kW								_							GERMANY
ł	speed: 2000 rpm															GERMANT
ł	armature voltage and current: 205 V/2 A;															
ł	field voltage and current: 205 V/0.33 A;															
1	NOTE: Should be provided all the accessories including books etc															
ł	UK, Germany or Equivalent															
12	THREE PHASE TRANSFORMER	36	0	5	0	4	4	49	1103+1103.1+	36	0	5 (n l	0	4 45	1103+1103.1+
1	Three phase transformer realised in didactic version.	50	Ŭ	5	Ŭ	-	-	75		50	U			Ŭ	3	V0171-GB
ł	Each primary and secondary windings are divided in two sections to allow many possibilities of connection including zig-								V0171-GB							
ł	zag.								HPS							HPS
l	Primary:400V (3x2x115V)								GERMANY							GERMANY
l	Secondary: 230V (3x2x66,5V)								Under specific							Under specific
l	Power: 300VA; Frequency 50/60Hz															
ł	UK, Germany or Equivalent															
13	SINGLE PHASE TRANSFORMER	20	0	г	0	4	4	40		36	0	Г	<u>,</u>	0	4 45	
13	Primary and secondary windings are divided in several sections to allow many possibilities of connections.	36	0	5	0	4	4	49	INCLUDED IN	30	0	5 (,	0	4 45	INCLUDED IN ITEM
l									ITEM NO12							NO12
ł	220/110V primary/secondary.								HPS							HPS
ł	Primary: 2x110V ac;								GERMANY							GERMANY
ł	Secondary: 2x55V ac;								_							_
ł	Power: 300VA; Frequency: 50-60Hz															
<u> </u>	UK, Germany or Equivalent		_	_	-	-					_		_			
14	SQUIRREL CAGE (3-PHASE) INDUCTION MOTOR 2707	40	0	5	0	0	4	49	2707.1	40	0	5 ()	4	4 53	2707.1
ł	Power: 0.37 kW								HPS							HPS
1	speed: 1400 rpm at 50 Hz; cos : 0.72															
1									GERMANY							GERMANY
1	star connection: 400 V/0.85A								GERMANY							GERMANY
ļ	delta connection: 230 V/1.47A								GERMANY							GERMANY
	delta connection: 230 V/1.47A Terminal boards:								GERMANY							GERMANY
	delta connection: 230 V/1.47A								GERMANY							GERMANY
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections:								GERMANY							GERMANY
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks)								GERMANY							GERMANY
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half.								GERMANY							GERMANY
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks)								GERMANY							GERMANY
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent															
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708	40	0	5	0	0	4	49	GERMANY 2708	40	0	5 (0	4	4 53	GERMANY 2708
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW	40	0	5	0	0	4	49		40	0	5 ()	4	4 53	
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74	40	0	5	0	0	4	49	2708 HPS	40	0	5 (0	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW	40	0	5	0	0	4	49	2708	40	0	5 ()	4	4 53	2708
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74	40	0	5	0	0	4	49	2708 HPS	40	0	5 ()	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A	40	0	5	0	0	4	49	2708 HPS	40	0	5 (0	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A	40	0	5	0	0	4	49	2708 HPS	40	0	5 ()	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A Terminal boards:	40	0	5	0	0	4	49	2708 HPS	40	0	5 ()	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols	40	0	5	0	0	4	49	2708 HPS	40	0	5 (0	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols Connections:	40	0	5	0	0	4	49	2708 HPS	40	0	5 ()	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half.	40	0	5	0	0	4	49	2708 HPS	40	0	5 (0	4	4 53	2708 HPS
	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact	40	0	5	0	0	4	49	2708 HPS	40	0	5 ()	4	4 53	2708 HPS
15	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half.	40	0	5	0	0	4		2708 HPS GERMANY	40	0	5 (2708 HPS GERMANY
15	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 2400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent							49	2708 HPS GERMANY PAK						4 53 0 0	2708 HPS
15	delta connection: 230 V/1.47A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent SLIP RING INDUCTION MOTOR 2708 Power: 0.25 kW speed: 1340 rpm at 50 Hz; cos : 0.74 star connection: 2400 V/1.15A delta connection: 230 V/2 A Terminal boards: imprinted with the respective symbols Connections: 4 mm safety jacks (thermal contact: 2 mm jacks) Provided with four machine feet and a coupling half. For protection against thermal overload all machines are equipped with thermal contact UK, Germany or Equivalent								2708 HPS GERMANY							2708 HPS GERMANY

17	STAR I DELTA STARTER (MANUAL) FOR INDUCTION MOTOR	40	0	E	0	0	4	49	PAK	0	0	0	0	0	0	0 Not Quoted
17	Power: 350 VA	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0 Not Quoted
	Voltage: 230/400 V-50 Hz															
	Rpm: 3000															
	2 poles															
	Excitation voltage: 220 Vdc															
	Operation also as synchronous motor with induction															
	itarting															
	Delta/star connection Constructive form: 1M 83															
	Protection: I P 22															
10	Integrated thermal protector CONTROL UNIT	40	0	-	•	•		40	2720	40	0	-	0			52 2720
		40	0	5	0	0	4	49	2730	40	0	5	0	4	4	53 2730
	The Control Unit 2730 controls the three-phase induction motor of the Brake Unit It comprises:								2719							2719
	Frequency converter								HPS							HPS
	Control unit								GERMANY							GERMANY
	RPM display															
	Torque display															
	Technical data															
	Mains connection:															
	220 230 V AC;															
	50 60 Hz															
	Working range of the															
	Control Unit: 0.5 120 Hz															
	n both directions															
	Accessories included															
	Connecting Lead, 4-pin															
	Connecting Lead, 8-pin															
	2 Connecting Leads															
	CAPACITOR MOTOR 2715	40	0	5	0	0	4	49	2715 HPS	40	0	5	0	4	4	53 2715 HPS GERMANY
	Power: 0.3 kW								GERMANY							
	peed: 1425 rpm at 50 Hz; cos : 0.93;															
	AC voltage 230 V															
	surrent: 2.1 A;															
	phase-shift and starting capacitor: 10uF/14uF															
	JK, Germany or Equivalent															
	JNIVERSAL MOTOR 2705	40	0	5	0	0	4	49	2705 HPS	40	0	5	0	4	4	53 2705 HPS GERMANY
	Power: 0.3 kW								GERMANY							
	peed: 2250 rpm															
	AC voltage and current: 230 V/3.4 A;															
	DC voltage and current: 130 V/3.4 A;															
	JK, Germany or Equivalent		-	-					2700			_	^			
	REPULSION MOTOR 2706	40	0	5	0	0	4	49	2706 HPS	40	0	5	0	4	4	53 2706 HPS GERMANY
	Power: 0.25 kW								GERMANY							
	peed: 2100 rpm at 50 Hz; cos : 0.69;															
	AC voltage and current: 230 V/2.9 A;															
	JK, Germany or Equivalent			-	-				0746	10	6	_	~			
	Split-Pole Motor 2716 Power: 0.12 kW	40	0	5	0	0	4	49	2716 HPS	40	0	5	0	4	4	53 2716 HPS GERMANY
		1	1	1	1			1		1	L					
									GERMANY							
	peed: 2700 rpm at 50 Hz; cos : 0.6;								GERIVIANY							
									GERMANY							

23	THREE-PHASE SYNCHRONOUS GENERATOR/ MOTOR WITH ASYNCHRONOUS STARTING 2707 Three-Phase Induction Motor Power: 0.37 kW speed: 1400 rpm at 50 Hz; cos : 0.72 star connection: 400 V/0.85 A delta connection: 230 V/1.47 A Synchronous Machine Power: 0.3 kW speed: 1500 rpm at 50 Hz; cos : 0.97 excitation current: 0.95 A star connection: 200 V/0.66 A delta connection: 200 V/1.44 A;	40	0	5	0	0	4	49	2707.1 2711+2289 HPS GERMANY	40	0	5	0	4	4	53	2707.1 2711+2289 HPS GERMANY
24	UK, Germany or Equivalent SPEED SLIP INDICATOR	40	0	5	0	0	4	49	5511 HPS GERMANY	40	0	5	0	0	4	49	5511 HPS GERMANY
25	CONTACT TECHOMETER	40	0	5	0	0	4	49	CHINA	40	0	5	0	0	4	49	CHINA
26	DIGITAL TACHOMETER • Table-top metal container, treated chemically with silk screen printed steel front panel • Reflection optical probe and reflection strip • Microprocessor measurement instrument with CPU Z 80 • Digital display (4 digits) • Measurement range: 0+9999 rpm 0+9999 ms (period) 0+9999 pulses 0+99.99 seconds (timer) • 4-digit selector for maximum measurement value	0	0	0	0	0	0	0	Rejected Under Specific & Bruchaer Missing	0		0	0	0	0	0	Rejected Under Specific & Bruchaer Missing
27	STROBOSCOPE type 4203 Germany/UK	40	0	5	0	0	4	49	461825 EXTECH USA	40	0	0	0	0	4	44	461825 EXTECH USA
28	AUTO-TRANSFORMER	40	0	5	0	0	4	49	CHINA at least 2.5AMP	0	0	0	0	0	0	0	Not Quoted
29	THREE PHASE SUPLY UNIT This power supply unit 2740.1 guarantees a clear experimental set-up and a short set-up time. Technical data - Mains connection, three phase: 380 415 V AC - Outputs, three-phase: with phase pilot lamp and safety switch, 3-pole (6 A) - Fixed DC: 200 V / 4 A (at 230 V mains) for field current supply of DC machines, with pilot lamp - DC, continuously adjustable: 0 250 V/4 A UK, Germany or Equivalent	40	0	5	0	0	4	49	2740.1 HPS GERMANY	40	0	5	0	4	4	53	2740.1 HPS GERMANY
30	MOTOR STARTER The Universal Resistor 2750 carries out the following functions in conjunction with the electric machines: - Starters and field rheostats for DC motors - Field rheostats for DC generators - Load resistors for DC generators - Starting resistors for slip ring motors - Load resistors for synchronous machines Technical Data Ring rheostat, 500 W - With protection series resistor: 1.8 /150 W	40	0	5	0	0	4	49	2750 HPS GERMANY	40	0	5	0	0	4	49	2750 HPS GERMANY

	RMS-AC Alternating true RMS, AV-AC+DC arithmetic average value switchover is possible for all ranges and types of measurement at any time measurement ranges for all types of measurements: Voltage:3/10/.30/100/300/1000 V, R=10 mohm, Current:0.1/0.3/1/3/10/30A, AV-Polarity indicators:2 LEDS, instrument: moving coil, class 1.5, 192x96mm(WxH),																
36	RMS METER Demonstration meter for measuring the true RMS voltage and current types of measurment:RMS-AC+DC total true RMS, RMS-AC Alternating true RMS, AV-AC+DC arithmetic average value switchover is possible for all ranges and types of	40	0	5	0	4	4	53	UT-89XE UNI-T CHINA	0	0	0	0	0	0	0	Not Quoted
35	PANEL FRAME-T 150, TWO LEVEL. 2 level frame for training panels in DIN A4 equivalent height, free standing design:3 aluminum profile reils with 2 brush strip, 2-T-base of rectangular steel buging, width 1450 mm, Height: 730mm, depth:300mm.	40	0	5	0	0	4	49	IT-2L EES PAK	0	0	0	0	0	0	0	Not Quoted
34	TACHO GENERATOR 1.0 For registering the speed of electrical machine of the 1.0 kw series, out put voltage +/- V/100 min-I	40	0	5	0	0	4	49	IT-197-60 EES PAK	0	0	0	0	0	0	0	Not Quoted
33	SHAFT EXD GUARD 1.0 Attachable guard for protection against contact with electrical machine rotating parts of the 1.0 KW series	40	0	5	0	0	4	49	IT-197-56 EES PAK	0	0	0	0	0	0	0	Not Quoted
32	COUPLING GUARD 1.0 Attachable guard for protection against contact with electrical machine rotating parts of the 1.0 KW series.	40	0	5	0	0	4	49	IT-197-56 EES PAK	0	0	0	0	0	0	0	Not Quoted
31	COUPLING 1.0 Rubber coupling sleeve for mechanical connection of two electrical machine of the 1.0 KW series.	40	0	5	0	0	4	49	IT-197-55 EES PAK	0	0	0	0	0	0	0	Not Quoted
	0 450 /0.5 A 450 1.5 k /0.25 A The Universal Resistor is equipped with a bridge rectifier for loading of synchronous generators with the Ring rheostat (500 W). The slip ring voltage of the Slip ring motor can also be rectified by means of the bridge rectifier. Thus all possible steps of the slip ring starter can be examined																
	Ring rheostat, 100 W (field rheostat) - 0 1.5 k , with 2-step winding and q-contact - Steps:																
	Vmax = 500 V AC Imax= 9 A																
	range: 1 k /180 W; Imax = 0.43 A - Bridge rectifier: 3-phase, B6																
	140 1 k /0.6 A - Additional series resistor, for expanding the resistance																
	32 56 /2.4 A 56 140 /1.7 A																
	- With 5-step winding: 1.8 11 /4.6 A 11 32 /3.5 A																

40	SET 32 SAFETY CONN. LEADS.	40	0	5	0	4	4	53	PAK	0	0	0	0	0	0	0	Not Quoted
	4mm safety connecting leads with 2.5 mm cable, current rating 322?A.m consisting of: 2 each safety connecting lead red																
	100cm																
	2 each safety connecting lead, Blue 100 cm																
	2each safety connecting lead red 50 cm																
	2each safety connecting lead blue 50 cm																
	2each safety connecting lead red 25 cm																
	2each safety connecting lead blue 25 cm																
	4each safety connecting lead black 100 cm																
	6each safety connecting lead black 50cm																
	6each safety connecting lead black 25 cm																

41	DOUBLE FREQUENCY METER, "Two independent meter movements for frequency comparison of two voltages measurement rang: 2x47 5053 Hz, Rated voltage: 380V, Instruments: vibration meter with tuned steel rod class 1.5 front frame 1'44x 144mm.	40	0	5	0	0	4	49	IT-6041 EES PAK	0	0	0	0	0	0	0	Not Quoted
42	SYNCHRONOSCOPE, With rotational indicator for phase comparison in synchronizing circuits with three phase of single phase AC Rated voltage: 380V, Instruments: air cero, electro dynamic quotient movement from frame: 144x144mm.	40	0	5	0	0	4	49	IT-197-44 EES PAK	0	0	0	0	0	0	0	Not Quoted
43	SHUNT 0.1 OHM, Plug-in element for current measurement in conjunction with the isolation amplifier and no 735 26. Resister:0.1 ohm, 8A, 1%	40	0	5	0	0	4	49	IT-197-01 EES PAK	0	0	0	0	0	0	0	Not Quoted
44	PAIR CABLES 50 CM, RED/BLUE Plug: 2= 4mm, with axial sockets: continuous current:10 A max; conductor cross section: 1.0 max.	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
45	3-PHASE IOSOLATING TRANSFORMER suitable for all circuit configurations. Al connections via 4mm safety sockets Power:300VA, Primary: 3x280/220V, 80Hz, Secondary 3x2x100 V.	36	0	5	0	4	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
46	1-PHASE ISOLATING TRANSFORMER All connections via 4mm safety sockets Power: 300 VA, Primary 220V, 80Hz, Secondary: 2 x 110V.	36	0	5	0	4	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
47	1-PHASE AUTO TRANSFORMER 0.3 All connections via 4mm safety sockets. Power 300 VA, Primary 220 V, 50 Hz, Secondary: 110/220/244 V.	40	0	5	0	0	4	49	IT-197-4V EES PAK	0	0	0	0	0	0	0	Not Quoted
48	RESISTIVE LOADS Three synchronously adjustable circular rheostats (step winding) with scale 100-0% each with a series resister and fuse in the sliding contact connection, suitable for parallel, series, star and delta circuits, Resistance:3x47—ohm, Series Resistance: 3x220 ohm, 3x 0.6 A.	40	0	5	0	0	4	49	IT-197-30A EES PAK	0	0	0	0	0	0	0	Not Quoted
49	CAPACITIVE LOAD Three groups of MP capacitors each consisting of three capacitors, suitable for parallel series, star and delta circuits" capacitance:3x1/2/4pF, 450V.	40	0	5	0	0	4	49	IT-197-31A EES PAK	0	0	0	0	0	0	0	Not Quoted
50	INDUCTIVE LOEAD Three inductances with taps at 0.2/0.4/0.6 H(0.65A), 0.3/1.0/1.2 H (0.5 A) and 2.4/4.8/6.0H(0.25A) suitable for parallel, series, star and delta circuits.	40	0	5	0	0	4	49	IT-197-32A EES PAK	0	0	0	0	0	0	0	Not Quoted
51	BEARING PULLER 3,4,6" CAPACITY three jaws	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
52	OIL CIRCUIT BREAKER for demonstration purpose, 220/240 (volt, 10-15 amp. 50 hz).	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
53	AIR CIRCUIT BREAKER: FOR DEMONSTARATION PURPOSE, 220/240 VOLT, 10-15 AMP 50HZ.	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
54	ARMATURE TEST GROWLER.	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
55	INDUCTION RELAY, demonstration type.	40	0	5	0	0	4	49	PAK	0				0			Not Quoted
56	OVER CURRENT/OVER VOLTAGE RELAY.	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted
57	CELL TESTER 1.5V	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted
58	BEARING PULLER, 4,8,12"	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
59	STAR DELTA STARTER, 30A, 400V	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
60	DIRECT ON LINE STARTER, 220V, 50A, 50 CYCLE	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
61	BATTERY CHARGER, input 230 V, 50 cycle, AC output3,6,12,V DC	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted
62	TELEPHONE EXCHANGE, Telephone exchange incoming lines 2 Nos., outgoing lines, 10Nos. along with telephone sets 10 Nos.	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted
63	AUTO TRANSFORMER STARTER , power 2HP, voltage 220 single phase.	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted

64	CURRENT TRANSFORMER, Primary 100 amp. Secondary 5 amp, maximum 600 volt.	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted
65	PETENTIAL TRANSFORMER, Primary 110 volt, secondary 11 KV	40	0	5	0	0	4	49	CHINA	0	0	0	0	0	0	0	Not Quoted
66	AMPERE METER WITH MOVING COIL, range 15. to 6A, 3 version, Demonstration type.	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
67	VOLTMETER(AC)BENCH TYPE FOR DEMONSTRATION, range 0 to 300 V, 0 to 500V,	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
68	INSULATOR, • Disc type 15 KV • Pin type: 15 KV, • Post type 15 KV Low voltage capacitance 750 V	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
69	12 LINE INTERCOM: With Digital Dialing and Provision for Secrecy Analog-with Connecting Accessories.	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
70	INDUCTION MOTOR. Capacitor type 5HP AC 3 phase	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
71	INDUCTION MOTOR, Capacitor 2 HP, AC Single phase.	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
72	COIL WINDING MACHINE: Hand operated, with counter, small size, mounted type.	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
73	ELECTRIC IRRON 220v, 1000w	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
74	PEDESTAL FAN 24″	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
75	VACUUM CLEANER 220V, 1300w	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
76	WASHING MANCHINE WITH DYRER	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
77	MICROWAVE OVERN	40	0	5	0	0	4	49	PAK	0	0	0	0	0	0	0	Not Quoted
78	EXHAUST FAN	40	0	5	0	0	4	49	РАК	0	0	0	0	0	0	0	Not Quoted
-	r: Sana Ullah, urer (Electrical) GCT, Nowshera	Mr. Ass					or (E	lect	rical) GCT, Pe	esh	aw	ar					