Tender # P-KR-18/10-01 (Item # 1)
Initial Specifications

Single fiber strength tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Universal testing machine	Designed for low force
2	Loadcell	5 N and above
3	Grips	Pneumatic, Lightweight
4	Speed	0.001-1000 mm/min
5	Travel distance	Min. 750 mm
6	Software	Included with analysis and results output software, that could be updated free of cost throughtout the product lifetime.
7	Data acquisition	
8	Calibration	Included with calibration equipment to ensure accuracy checks
9	Extension resolution	Min. 0.001 mm
10	Test standards	ISO 5070, BS 3411 and others applicable standards

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Tender # P-KR-18/10-01 (Item # 2)
Initial Specifications

High Volume Instrument	
	Tender Specifications
1	Can test the color characteristics and trash particle content in cotton
2	Able to determine fineness and maturity properties of fiber
3	Determine fiber length and tensile properties
4	Automatic Color Tray or increased sampling for higher throughput
5	Dual Sampler for increased sampling for higher throughput
6	Data acquistion system

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Tender # P-KR-18/10-01 (Item # 3)
Initial Specifications

Yarn Evenness Tester

Sr#	Specifications
1	Determination of trash and dust particles in the yarn
2	Determination of the diameter, roundness, density and the surface structure of the yarn
3	Determination of the yarn hairiness
4	Measuring unit for heavy sliver, wool tops in the range 12–80 ktex
5	Determination of the unevenness and imperfections (thin and thick places plus neps)
6	Determination of foreign matter
7	Measurement of humidity and temperature in the environment of the test unit

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Tender # P-KR-18/10-01 (Item # 4)
Initial Specifications

Fabric Tensile Tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Load capacity	Min. 5 KN
2	Test Speed	0.001-1000 mm/min.
3	Travel distance	Min. 750 mm
4	Throat depth	100 mm
5	Software	Included with analysis and results output software, that could be updated free of cost throughtout the product lifetime.
6	Standards	Meet ISO, ASTM, European and other standards for Textiles, Leather and films

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Tender # P-KR-18/10-01 (Item # 5)
Initial Specifications

Fabric Tear Tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Operation	Automatic Electronically controlled device with versatile tear testing options
2	Braking system	Electronic braking (electromagnetic) and two button release
3	Control	Controlled and measurements with a microprocessor
4	Weights	Pendulum and verification weights of 8N, 16N, 32N, 64N, and 128N (5 grade measuring range)
5	Encoder	Angular encoder
6	Range	Testing range of 128 N
7	Pendulum	Adjustable pendulum balance
8	Plateform	Stable platform
9	Memory	Capability to save standard and custom made test methods
10	Units	Units display: mN, cN, N, g, Kg, oz, LB
11	Software	Included with analysis and results output software, Series of testing weights with highest capacity and Pendulum Kit
12	Standards	ASTM D1424
		ASTM D5734
		BS 4468
		DIN 53862
		DIN 53128
		ISO 1974
		ISO 9290
		ISO 13937-1
		M&S P29
		NEXT 17
		AFNOR G07-149
		ASTM D689
		WSP 100.1
		ASTM D1922
		ISO 4674-2
		EN 21974
		GB /T 455
		JIS P8116
		TAP PI T414
		UNI 6444
		GB /T 11999
		ISO 6383-2
		JIS k7128-2
13	Reference	Reference of labs currently using the instrument in Pakistan (Prefeably in Faisalabad)

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Tender # P-KR-18/10-01 (Item # 6)
Initial Specifications

Fabric Crease recovery tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Operation	Standard fabric crease recovery tester in two versions for applying different loads (10N and 19.63N weights) to meet the requirements of European and American standards
		Must Include
		European Standards (EN, ISO and M&S)
		Loading Device (10N and 19.63N weights)
		Specimen Tweezers (Metal)
		Specimen Tweezers (Plastic)
		Specimen Template 40 x 15mm
		Specimen Template 50 x 25mm
		Pack (25 sheets 100 x 150mm) Paper Tissue
		American Standards (AATCC)
		Loading Device (500g weight)
		Specimen Tweezers (Metal)
		Specimen Tweezers (Plastic)
		Specimen Template 40 x 15mm
		Specimen Template 50 x 25mm
		Pack (25 sheets 100 x 150mm) Paper Tissue
2	Reference	Reference of labs currently using the instrument in Pakistan (Prefeably in Faisalabad)

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Tender # P-KR-18/10-01 (Item # 7)
Initial Specifications

Wrinkle recovery tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Capability	Determine the appearance of textile fabrics after induced wrinkling
2	Precision	Precise spiral column
3	Weights	A range of weights to fulfil different standards
4	Standards	ISO 9867, AATCC 128
5	Mendatory accessories	Viewing board, Comparsion replicas

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Tender # P-KR-18/10-01 (Item # 8)
Initial Specifications

Fabric stiffness tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Capability	Ability to determine bending height, flexural rigidity, and bending modulus
2	Scope	Woven, knitted and non woven fabrics
3	Mendatory accessories	Reflection mirror, sample cutting template
4	Standards	ASTM D1388, BS 3356

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Tender # P-KR-18/10-01 (Item # 9)
Initial Specifications

Fabric thickness tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Pressure foot	1.129" diameter under a load of 0.6 Psi
2	Thickness range	0- 25 mm
3	Standard	ASTM D1777
4	Display	Digital
5	Mendatory accessories	Weights

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Tender # P-KR-18/10-01 (Item # 10)
Initial Specifications

Fabric Drape Tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Operation	A. The instrument must be able to determine the following by using photographic method (paper weighing method is not acceptable); 1. Drape coefficient 2. Aesthetic coefficient 3. Liveliness ration Liveliness ration B. The instrument must work in static and dynamic modes. It must be able to rotate at 90 rotations per minute (minimum) C. The instrument must include the software, connecting cable, sample template and calibration plates.
2	Standards	BS 5058 , BS EN 9073, AFNOR G07-109, ERT 90-1, UNI 8279, GB /T 23329
3	Compulsory Accessories	Templates with paper rings of diameter 24 cm, 30cm and/ or 36cm
4	Reference	Reference of labs currently using the instrument
5	Reference	Reference of labs currently using the instrument in Pakistan (Prefeably in Faisalabad)

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Tender # P-KR-18/10-01 (Item # 11)
Initial Specifications

Fabric Hydrostatic Head Tester	
S.N.	**Tender Specifications**
1	Internal water reservoir
2	Maximum pressure 3 bar
3	10 cm^2, 19.63 cm^2, 26 cm^2 , 28 cm^2, 100 cm^2 test head and Pore Size Attachment included
4	Fulfills AATCC 127 BS 3321 ERT 120-1 ISO 811 AFNOR G07-057 BS EN 20811 ERT 160-0 ISO 9073-16 JIS1092 B-b ASTM D751 EN 343 GB/T 4744 IST 080.4 (01) IST 080.6 (01) WSP 080.6.R4 (12)
5	Securely holds samples of up to 30 mm thick

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Tender # P-KR-18/10-01 (Item # 12)
Initial Specifications

Light Fastness Tester		
S.N.	**Characteristic**	**Tender Specifications**
1	Lamp	Xenon arc lamp according to ISO, AATCC and EN standards
2	Reference lamp	Calibrated xenon reference lamp
3	Cooling system	Water / Air cooled
4	Exposure area	Minimum 2100 cm^2
5	Irradiance Monitoring System	Efficient radiometer for irradiance monitor
6	Irradiance (300-400nm) Range	Setting and control of irradiance for 340nm, 420nm, 300-400nm or Lux
7	Custom xenon spectrum	Should be equipped with interchangeable glass filters to adjust xenon light spectrum as per requirments
8	Test Chamber Humidity Range	Setting and control of relative humidity (Ambient – 95% RH) with efficient system
9	Test Chamber Temperature Range	Ambient – upto 60 °C Setting and control of air temperature
10	Sample capacity	Should be able to expose 60 samples at a time
11	Black Standard Temperature Range	Ambient – upto 70 °C. Setting and control of Black Panel Temperature; uninsulated (BPT) or insulated (BST)
12	Water Reservoir Capacity	30 liters
13	Water Consumption (ISO 105-BO2 Normal)	0.9 L/hr
14	Air and water purity	Dust filters for intake air Water purity indicator
15	Variation reduction system	Should have a dedicated system for reduction in variation of chamber temperature and humidity
16	Software and Display	Touch display control panel (minimum 12") with control of all test parameters Pre-programmed test methods for ISO, AATCC and other common standards Possibility for developing custom methods Auto fault detection and display of diagnostics on touch display
17		AATCC 16 AATCC 169 ASTM C1442 ASTM D2565 ASTM D3424 ASTM D4303 ASTM D4355 ASTM D4459 ASTM D4798 ASTM D5071 ASTM D6551 ASTM D6695 ASTM D904 ASTM E1596 ASTM G151 ASTM G155 FLTM BI 160-01 GME 60292 GMW 14162 GMW 3414 ISO 105-B02 ISO 105-B04 ISO 105-B06 ISO 105-B10 ISO 12040 ISO 16474-2 ISO 3917 ISO 4892-1 ISO 4892-2, JASO M346 MIL-STD 810F MIL-STD 810G PV 1303 PV 3929 SAE J2412 SAE J2527 VDA 621-429 VDA 621-430 VDA 75202 VW PV 3930
18	Compulsory Accessories	All sample holders for complete frame to meet above test standards Water purification system
19	Safety standards	Must meet UL, CE, ISO, EN and CSA safety and electrical standards
20	Reference	Reference of labs currently using the instrument in Pakistan (Prefeably in Faisalabad)

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Tender # P-KR-18/10-01 (Item # 13)
Initial Specifications

Flameability tester		
S.N.	Characteristic	Tender Specifications
1	Switch	Marker thread switch
2	Test frames	interchangeable test frame with frame stubs and pins
3	Finishing	heat resistant finish
4	Ignition	automatic ignition
5	Controls	burner to specimen adjustor
		gas flow regulator
		burner setting guages
6	Data extraction	test report exportation
7	Standards	EN ISO 6940
		EN ISO 6941
		EN ISO 15025
		EN 1101,1102
		EN 71-2
		EN 13772
		EN 13722
		EN 1624
		EN 1103
		EN 14878
		EN 1625
		BS EN 532
		BS 7837,5722, 5867-2, 6249
8	Gas burners	range of gas burners as accessories to comply with all standards
9	Reference	Reference of labs currently using the instrument in Pakistan (Prefeably in Faisalabad)

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Tender # P-KR-18/10-01 (Item # 14)
Initial Specifications

UV-Vis Spectrophotometer

Optical Design	Double beam with sample and reference cuvette
Spectral Bandwidth	0.5, 1.0, 1.5, 2.0, 4.0 nm
Detectors	Dual Matched Silicon Photodiodes
Wavelength Range	190 – 1100 nm
Accuracy	± 0.20 nm (546.11 nm Hg emission line) ± 0.30 nm 190 – 900 nm
Repeatability	Peak separation of repetitive scanning of Hg line source < 0.10 nm Standard deviation of 10 measurements < 0.05 nm
Scan Speed	3800, 2400, 1200, 600, 240, 120, 60, 30, 10, 5, 1 nm/min
Data Interval for Scanning	10, 5, 2, 1, 0.5, 0.2, 0.1, 0.05 nm
Linear Range	> 4 A
Display	± 6 A
Readout/Node	Absorbance, % Transmission, % Reflectance, Concentration
Accuracy	1A: ±0.004 A 2A: ±0.004 A 3A: ±0.006 A
Mounted LCD	Yes
PC connectivity	Yes

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Tender # P-KR-18/10-01 (Item # 15)
Initial Specifications

Atomic Absorption Spectrophotometer

Optics	Double Beam (chopper mirror)
Monochromator	aberration corrected Czerny-Turner monochromator Holographic grating (1,800 lines/mm)
Wavelength range	190-900 nm (Automated wavelength selection)
Wavelength accuracy	±0.3 nm
Baseline Stability	0.005A/30min
Sensitivity (Cu)	Approx. 0.9A at 5 ppm
Slits	Automated slit selection 0.1; 0.2; 0.4; 0.7; 1.4; 2.0 nm
Detector	Automated 8-lamp turret with independent lamp power supply for each lamp and two heating circuits for preheating lamp operation. Non-coded lamp and coded lamp can be used for analysis.
Burner Head	Titanium Alloy Burner
Nebulizer	High-Efficiency Glass Nebulizer
Spray Chamber	Corrosion-Resistant Material (Polypropylene/polyphenylene sulfide)
Position Adjustment	Automatic Changeover of Flame and Furnace
Gas Controls	Programmale gas control feature with software controled gas flow with automatic setting of gas flow for each element
Safety	Automatic Ignition and Off Mixing Air-Acetylene Gas with Safety Control

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Tender # P-KR-18/10-01 (Item # 16)
Initial Specifications

Digital Weighing Balance		
S.N.	**Characteristic**	**Tender Specifications**
1	Capacity	Minimum 300 gm
2	Accuracy	0.1 mg
3	Internal calibration	Yes (Defined by user). Generate and print calibration reports
4	Communication	Send balance data to Excel or other Windows applications without any data communication software installation required.
5	Standard	Meets requirements of GLP/GMP/ISO9000
6	Reference	Reference of labs currently using the instrument
7	Reference	Reference of labs currently using the instrument in Pakistan (Prefeably in Faisalabad)

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Tender # P-KR-18/10-01 (Item # 17)
Initial Specifications

Digital Viscometer

Rotation speed	0.3 and 250 rpm
Conformance with Standards	ASTM / DIN ISO 2555 / ISO 3219 oder MS-R Standards
Torque Range	From 0.05 to 13 mNm and From 0.005 to 0.8 mNm
Temperature	-50 °C to + 300 °C.
Accuracy	+/- 1 %
Repeatability	+/- 0.2 %
Measuring Capacity (ml)	3-100 ml
Viscosity Range	3 - 180,000,000 mPa·s
Display Option	Viscosity – Speed – Torque – Temperature - Time – Measuring geometry, Level of sensitivity – Date/hour - Choice of viscosity units: cP or mPa·s Language: French/English
PC Connection	USB connection

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Tender # P-KR-18/10-01 (Item # 18)
Initial Specifications

Thermocouple Calibration Apparatus	
	Tender Specifications
1	To be used for the calibration of different types of thermocouples used in process. It is provided with different types of thermocouples, connecting wires, multi meter, furnace (as a heat sources), air blower etc.
2	Heat source: Water Heater, Vacuum Flask, Air Blower (Hot/Cold)
3	Resistance Detective Sensor (RTD) – PT100
4	Thermistor Sensor
5	Type K Thermocouple Sensor
6	Mercury in Glass Thermometer (-10°C to 110°C)
7	Mercury in Glass Thermometer (-5°C to 330°C)
8	Bimetallic Thermometer (0°C to 120°C)
9	Vapor Pressure thermometer (0°C to 115°C)
10	Self-Adhesive Surface Thermometer
11	Range 2 (0°C to 30°C)
12	Range 3 (30°C to 60°C)
13	Wet and Dry Bulb Thermometer (Hygrometer)
14	Type K Thermocouple Wires
15	Type J Thermocouple Wires
16	Temperature Calibrator

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Tender # P-KR-18/10-01 (Item # 19)
Initial Specifications

Time Constant Calculation Apparatus	
	Tender Specifications
1	To be used for the calculation of time constant of mercury (glass-bulb) thermometer. It uses heating mantle, round bottom flask, oil/water, thermocouples, glass bulb thermometers, temperature controller etc.
2	Water Bath:Ice Flask, Hot water tank with Heat Plate, Thermocouples & Temperature Sensors, K Type, J Type, RTD (PT-100)
3	Control Panel & Software designed in LABVIEW environment to run under any Window platform
4	220V/AC, 50 Hz
5	Data acquisition system

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Tender # P-KR-18/10-01 (Item # 20)
Initial Specifications

Pressure Gauges Calibration Apparatus	
	Tender Specifications
1	To be used as a calibration apparatus which is used for the calibration of bourdon pressure gauges. It is equipped with PID controller, compressor, needle valve, solenoid valves, safety valve, digital/master gauge, bourdon pressure gauges, transducer, storage tank etc. It uses air as a gas whose pressure is controlled at any specific desired value and the gauges are accordingly calibrated.
2	Measuring devices for pressure and vacuum
3	U-tube and inclined tube manometers
4	Bourdon tube manometer, pressure above atmospheric
5	Bourdon tube manometer, pressure below atmospheric
6	Plastic syringe generates test pressures in the millibar range
7	Bourdon tube manometer: 0...60mbar
8	U-tube manometer: 0...500mmWC
9	Inclined tube manometer: 0...500mmWC
10	Pressure Transmitter with Digital Display: 0 to 4 bar
11	Calibration Gauge: 0 to 4 bar
12	Calibration Source: Pressure Pump Hand Operated with Built in Safety
13	Pressure Control: Regulator with Valve
14	Data Acquisition Unit
15	PC Interface Software

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Tender # P-KR-18/10-01 (Item # 21)
Initial Specifications

Dead weight apparatus	
	Tender Specifications
1	Application: Suitable for for the calibration of bourdon pressure gauges
2	Pressure gauge: Bourdon tube range 0 to 4 bars (0~50 PSI)
3	Area of piston: 244.8x 10-6 m2
4	Mass of piston: 0.5kg
5	Ancillary masses: 0.5kg, and 1.0 kg
6	Gauge diameter: 100 mm
7	Lubricant Oil

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Tender # P-KR-18/10-01 (Item # 22)
Initial Specifications

Temperature process station	
	Tender Specifications
1	To be used to control temperature. It is fitted with PID controller, pumps, valves, heaters, bi-metallic gauge, k-type thermocouples, service tank, process tank, stirrer, radiator etc. It uses water as a liquid whose temperature is controlled at any specific desired value inside the process tank.
2	Fixed Supply DC: +12V, +15V, -15V & +24V
3	Process Vessel: 5 Liter approx.
4	Storage tank: 20 Liter approx.
5	Heater Element: 200W
6	Water Circulation Pump: 10 l/min
7	Piping: PVC
8	Thermal Sensors: K-Type Thermocouple, PT100, Bi-metallic Direct Reading
9	Valves: Drain Valve Manual Type
10	Level Sensor: Float Switch with LED indicator
11	Flow Sensor: Rotameter Direct Reading Type
12	Cooling Temperature Controller: Auto Control with PID
13	Cooling Apparatus: Heat Exchanger with Fan
14	Operation Mode: Internal & External
15	Temperature Sensor Interface: DC Amplifier with Offset and Gain Control
16	ON/OFF Control: Comparator with Hysteresis Control
17	Analog Source: 0 ~ ±10V
18	PID Controller: Proportional, Integral & Differential Control with Feedback
19	Pump Driver: DC to PWM Driver with DC Level Offset Control
20	Heater Driver: DC to PWM Driver with DC Level Offset Control
21	Accessories: Power Cord, 2mm Patch Cord, Experiment Manual,
22	Data Acquisition Unit
23	PC Interface Software

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Tender # P-KR-18/10-01 (Item # 23)
Initial Specifications

Pressure process station	
	Tender Specifications
1	Used to control pressure. It is fitted with PID controller, compressor, needle valve, motorized valve, solenoid valves, safety valve, bourdon pressure gauges, transducer, storage tank, process tank etc. It uses air as a gas whose pressure is controlled at any specific desired value inside the process tank.
2	Fixed Supply DC: +12V, +15V, -15V & +24V
3	Vessel: 5 Liter approx.
4	Piping: Plastic
5	Pressure Sensor: Manometer Direct Reading, Strain Gauge
6	Valves: Manual, Solenoid, Motorized valve, No Return, Safety set at 2.0 Bar
7	Pump: 35psi
8	Pressure Sensor Interface: Differential Amplifier with Offset and Gain Control
9	ON/OFF Control: Comparator with Hysteresis Control
10	Analog Source: 0 ~ +10V, 0 ~ ±10V
11	PID Controller: Proportional, Integral & Differential Control with Feedback
12	Pump Driver: DC to PWM Driver with DC Level Offset Control
13	Solenoid Valve Driver: ON/OF Control with Driver Manual & auto
14	Accessories: Power Cord, 2mm Patch Cord, Experiment Manual,
15	Data Acquisition Unit
16	PC Interface Software

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Tender # P-KR-18/10-01 (Item # 24)
Initial Specifications

Level process station	
	Tender Specifications
1	Used to control of liquid level. It is fitted with PID controller, pump, valves, variable-area flow meter, DP transmitter, feed tank, process tank etc. It uses water as a liquid whose level is controlled at any specific desired value inside the process thank.
2	Fixed Supply DC: +12V, +15V & +24V
3	Vessel: Dual 5 Liter approx.
4	Water Circulation Pump: 10 l/min
5	Piping: Plastic
6	Level Sensor: LVDT, Float Switch
7	Flow Sensor: Direct Reading
8	Valves: Drain, Solenoid, Needle
9	Level Sensor Interface: Precision Rectifier with Offset and Gain Control
10	ON/OFF Control: Comparator with Hysteresis Control
11	Analog Source: 0 ~ ±10V
12	PID Controller: Proportional, Integral & Differential Control with Feedback
13	Pump Driver: DC to PWM Driver with DC Level Offset Control
14	Solenoid Valve Driver: ON/OF Control with Driver
15	Accessories: Power Cord, 2mm Patch Cord, Experiment Manual
16	Data Acquisition Unit
17	PC Interface Software

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Tender # P-KR-18/10-01 (Item # 25)
Initial Specifications

Flow process station	
	Tender Specifications
1	Suitable for control of fluid Flow. To be fitted with PID controller, pump, frequency variable device, manual valve, motorized valve, variable-area flow meter, turbine-type flow meter, feed/process tank etc. Uses water as a liquid whose flow is controlled at any specific desired value inside the process thank.
2	Fixed Supply DC: +12V, +15V, & +24V
3	Vessel: 5 Liter approx.
4	Water Circulation Pump: 10 l/min
5	Piping: PVC
6	Flow Sensor: Direct Reading Rotameter & Turbine Type Flowmeter with Pulse output
7	Control Valves: Manual, Motor Driven
8	Flow Sensor Interface: F/V Converter with Offset and Gain Control
9	ON/OFF Control: Comparator with Hysteresis Control
10	Analog Source: 0 ~ ±10V
11	PID Controller: Analog Proportional, Integral & Differential Control with Feedback
12	Pump Driver: DC to PWM Driver with DC Level Offset Control
13	Motor Valve Driver: ±10V ON/OF Control
14	Accessories: Power Cord, 2mm Patch Cord, Experiment Manual
15	Data Acquisition Unit
16	PC Interface Software

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