Water Technology WorldSkills Package for Lyon 2024

Quotation/Proforma Invoice

124.251-2

Project 1729365
Water Technology WorldSkills Package

Date

16.11.2023

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Customer No.

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Content

Position	Quantity	Description

WorldSkills Water Technology - EduKit PA Basic and Advanced

Pos. 1 | 1,00

Equipment set

549822

Picture similar

EduKit PA Basic for process technology

The EduKit PA Basic for process technology deals with projects with the following content:

- Assembly
- Commissioning
- Manual measurement, open and closed-loop control
- System efficiency analysis

The system is handy, easy to transport and simple to set up. It provides an introduction to closed-loop control without the need for sophisticated control technology. It is consistent and compatible with existing Festo Didactic systems and can be expandable. A workbook with solutions is available.

EduKit PA Basic package contains:

- Aluminium profile plate 350 x 200 x 20 mm
- Two transparent circular water tanks with mounting frame and aluminium profile stand
- Flexible pipe system DN15
- Rotary pump, normal intake, 24 Volt/26 W
- Electrical actuation with connecting block for pump connection, terminal strip, 2 buttons (NO and NC contact), 1 control switch and 1 LED indicator light (24V) for front panel installation with mounting bracket; 1 relay with 3 changeover contacts on mounting plate
- Pressure gauge
- Flow meter, float principle
- Various small parts for construction and assembly

The EduKit PA Basic is partially assembled and pre-wired.

Technical data:

- Power supply 24 V DC
- Packaging dimensions: 39.5 cm x 29.5 cm x 52.5 cm
- Assembly area: 35 cm x 20 cm
- Max. height at max. construction: approx. 110 cm
- Power supply unit 24 V DC, 4.5 A required

Version: EduKit PA Basic

1x Pump 170712
2x Tank, round 548596
1x Flow meter 548604

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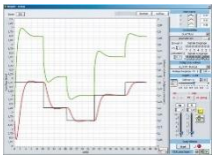
Position	Quantity	Description
Pos. 2	1,00	**Pipe/tub cutter** 7658 Pipe and tubing cutter For plastic and Perbunan tubing with and without fabric reinforcement with outside diameters up to 20 mm. Ensures a vertical, burr-free cut through positive locking of tubing in the cutter. It also has a safety clip to prevent unauthorized opening. Supplied with two spare blades.  Picture similar
Pos. 3	1,00	**Tool** 539767 **Tool set** The tool set is an aid to easy working on stations. A practical mini-systainer includes: • 200 mm steel rule • Open-jawed spanners size 7, 8, 9, 10 • Adjustable spanner • Side cutter • Insulation-stripping pliers • Wire end sleeve pliers • Screwdriver set, hex, 1.5 – 6 • Screwdriver, hex, 0.9; 1.3 • Screwdriver, cross-head, PZ02 – short • Screwdriver, flat, 2.5 x 75; 4.0 x 100 • Screwdriver, flat, 1.2 – 1.6 • Tubing cutter • Fiber-optic cable cutter • Workpiece, red, black, silver • 100 x cable binders 2.5 x 100 • 100 x wire end sleeves 0.25 • 100 x wire end sleeves 0.75  Picture similar

Position	Quantity	Description
Pos. 4	1,00	**Power pack** 162417 **Tabletop power supply unit** • Input voltage: 85 – 265 V AC (47 – 63 Hz) • Output voltage: 24 V DC, short-circuit-proof • Output current: max. 4.5 A • Dimensions: 75 x 155 x 235 mm Type: Connector as per CEE 7/VII for DE, FR, NO, SE, FI, PT, ES, AT, NL, BE, GR, TR, IT, DK, IR, ID  Picture similar
Pos. 5	1,00	**Equipment set** 564631 Edukit PA Advanced The EduKit PA Advanced for process technology deals with projects with the following content: • Assembly • Commissioning • Automated measurement, open and closed loop control • System efficiency analysis The EduKit PA Advanced set is handy, easy to transport and simple to set up. It provides an introduction to automated closed loop control. The electrical interface board with SysLink connection enables the EduKit PA Advanced to be actuated using a PLC board, an I/O simulation box, FluidSim® or FluidLab PA in conjunction with EasyPort. EduKit PA Advanced package contains: • Electrical interface board, pre-wired and consisting of - I/O terminal for 8 digital outputs, 8 inputs with SysLink plug connection - Terminal block for analogue signals with 15-pin SUB-D connection - 24 V DC DIN H-rail relay with operating indicator - Motor controller with pulse width modulation for DC motors - Starting current limiter - 4-wire basic terminal block - Connection block 2-pin • 2 x capacitive sensor with mounting components and cable • Ultrasound proximity switch incl. plug socket with cable • Flow sensor with rotor and opto-electronic (infrared) evaluation incl. f/U transducer and cable • Pressure sensor 0 - 400 m bar, analogue output 0 - 10 V DC incl. connecting cable and screw-in fitting  Picture similar

Position	Quantity	Description
		• Directly controlled 2/2 way solenoid valve; incl. connecting cable and screw-in fitting • Systainer®, 100% ABS plastic with inserts with carrying handle To use the EduKit PA Advanced modules, the EduKit PA Basic is required. Version: EduKit PA Advanced in the Systainer 1x I/O board for EduKit PA 549823 2x Sensor, capacitive 549824 1x Sensor, ultrasound 548689 1x Flow sensor for EduKit PA incl. transducer 549825 1x Pressure sensor 0 – 400 mbar 549826 1x 2/2-way solenoid valve 549827
Pos. 6	1,00	**Teachware** 563971 **Workbook for EduKit PA** This workbook explains the basic principles of process technology and provides an introduction to the subject. It covers manual and automated measurement, open and closed-loop control and system design topics such as planning, installation, commissioning, marketing and sales. You will be provided with exercises including all necessary worksheets as well as didactic information and solutions as support for trainers. The workbook contains detailed descriptions of the problems and parameters. The worksheets guide students through the required steps of planning, execution and function testing. The measurement/open and closed-loop control exercises relate to flow, level and pressure technology. The workbook includes a USB-Stick with or download access to the worksheets, data sheets and solutions. Workbook with solutions for control technology / process engineering training with EduKit PA. Trainees will learn how to classify different systems, describe components and functions and commission systems. This workbook can be used together with EduKit PA for process automation to achieve the following training goals: • Knowledge of the design and functioning of EduKit PA • Understand and complete flowcharts • Understand and complete simple electrical circuit diagrams • Become familiar with the setup and mode of operation of a pressure gauge • Become familiar with the setup and mode of operation of a pump • Become familiar with the setup and mode of operation of a flow sensor • Record and analyse characteristic curves • Knowledge of the terms control and closed-loop control

Picture similar

Position	Quantity	Description
		• Knowledge of the principles of a discontinuous controller (two-step action controller) and a continuous controller • Knowledge of essential systems engineering work steps, from planning to operation B. Schellmann, H. Kaufmann 2009 edition, 430 pages, in folder, bound, incl. CD-ROM. Campus licence – permission to copy for internal purposes inclusive Campus licence: en
Pos. 7	1,00	**Carriage** 8039990 Trolley with plate Stable sheet steel construction with table plate. Dimensions (W x H x D including rollers to bottom edge of profile plate): 700 x 770 x 700 mm  Picture similar
Pos. 8	1,00	**Interface** 548687 EasyPort USB – An interface for measuring, open-loop control, closed-loop control. Connects the simulation to the real world EasyPort USB as table-top equipment for the transmission of analogue 0 to 10 V and 24 V digital process signals via USB to the PC. Via the SysLink interface (digital signals) and via a SUB D 15-pin plug connector (analogue signals), the EasyPort USB can be connected from the PC for measurements, control and adjustment to MPS®/MPS® PA stations, training packages or PLC boards. Technical data EasyPort USB: • 2 x 24 pin IEEE 488 compatible plug connectors SysLink for MPS®/MPS® PA station, training package, PLCs each with 8 digital inputs and 8 digital outputs (16I /16O) • 1 x SUB D 15-pin plug connector for MPS/MPS PA station, training package, PLC with 4 analogue inputs and 2 analogue outputs (12 bit resolution) • 24 V power supply connection via separate screw terminals or via SysLink • USB 2.0 interface to PC (galvanically separated) • Large LCD display • Display of digital signals: via LED  Picture similar

Position	Quantity	Description
		The external PC interface can be used on the workbench or can be fixed to an aluminium profile with optionally available fixings. As standard, delivery includes: • 24 V connecting cable to 4 mm safety connectors • USB cable • CD-ROM: - 2D process display - EasyOPC driver - Datasheet - ActiveX control - Examples for control via LabVIEW Type: EasyPort USB
Pos. 9	1,00	**Cable** 34031  Picture similar I/O data cable with SysLink connectors (IEEE 488) For connection of SysLink interfaces, for example an EduTrainer PLC, with the universal connection unit, digital (Order no. 162231). 2.5 m
Pos. 10	1,00	**Cable** 529141  Picture similar Analogue cable, parallel EasyPort/PLC connection for a real process or a simulation box. Analogue cable, parallel, 15-pin SUB-D type connector on both ends, 150 cm. 2 m
Pos. 11	1,00	**Software** 544304  Picture similar **FluidLab®-PA closed loop: Control engineering in focus** Using FluidLab®-PA step by step to teach and demonstrate the fundamentals of control technology. The EasyPort is used to connect the PC and real hardware, e.g. the EduKit PA, the MPS® PA compact workstation or the MPS® PA filtration station, mixing, reactor, filling.

Position	Quantity	Description
		Settings Parametrization of sensor values with factor and offset to represent the physical quantities as well as signal attenuation per median filter for the analog input signals. Display of the physical value in the variable units field. Other possible settings are the inversion of the controller direction, Y offset in the continuous rules and the selection of the simulation mode. **Menu: Measurement** All binary and analog process data, for example the signal statuses of the sensors, process fittings, and pump, can be displayed graphically and evaluated directly. To record the sensor characteristic and determining a step response, functions are available such as selection of measuring channels, adjusting the test time or cursor evaluation with zoom function. **Menu: Characteristic curve** The characteristics of a final control element (e.g. pump or proportional valve) is investigated in various perspectives (voltage for flow, flow for pressure, pressure for voltage). **Menu: 2-point controller** Typical applications are level and temperature controlled systems. **Menu: Continuous regulation** Experimentation, configuration and optimization of the control processes (P, PI, PD or PID controller) with immediate effect in the process. Controlled systems can be operated via mouse click. Trouble-free documentation of the control parameter is possible. The measured values and curve profiles can be documented comprehensively. The **block diagram** can be displayed as a function menu for all continuous controllers with current numerical values. **Industrial controller functions** System operation like in a process control system. It is possible to specify nominal values and switch the controller between manual and automatic. **Simulation** A simulated process model illustrates the sequence identically to the operation of the real hardware. FluidLab®-PA for **MPS® PA stations** is included. **System requirements** • PC with Windows 7/8/10 • Pentium III or equivalent • 2 GB RAM • 500 MB free hard disk space • USB 2.0/3.0 or serial interface • Display resolution: 1280 x 1024 pixels Version (language): Single licence on CD-ROM de/en/es/fr/sv

Position	Quantity	Description
Pos. 12	1,00	**Software** 567224  Picture similar **FluidLab PA process: Getting started in process engineering** **Simple application of complex relationships** The clear menu structure proceeds from the commissioning of the EduKit PA or Compact workstation to the process engineering using the example of a bottling plant. **Menu: Guided commissioning** A check list like in industry. After processing, the system is activated. A commissioning protocol can be printed out for documentation. **Condition monitoring** Safety and efficiency are checked by means of permanent recording of machine status. Detects and analyzes deviations with FluidLab® PA process. **Menu: Operation, open- and closed-loop control with the EasyPort** Experience the behavior of a system using simple process examples. Control-technology operations and continuous and discontinuous controllers are presented. Subsequent analyzes bring a valuable, basic understanding which can be transferred to the general technology. Especially general training aims, such as the concentrated observation and analysis of systems, are encouraged. **Menu: FluidSIM** Develop and immediately test control-technology relationships – whether virtual or real. Program one's own process sequence in FluidSIM: electrical circuit diagram, logic diagram and GRAFCET. **Menu: Virtual reactor** Animated by a sequencer – observing, analyzing and documenting the simulated processes. Production according to customer order and assessing and responding to error messages are in demand. **Menu: Virtual PLC – actuating with STEP 7, PLCSIM or CODESYS® simulation** Learn the basics of PLC programming and the logical processing of binary and analog signals. Test the program on a virtual or real model. **Menu: Filling with Excel interface** FluidLab PA is transmitted order data from MS Excel via the DDE interface, e.g. the number and volume of the bottles. Conversely, the current status of the plant, for example the level of the storage tanks, is reported. FluidLab® PA for **MPS PA stations** is included. **System requirements** • PC with Windows 7/8/10 • Pentium III or equivalent • 2 GB RAM • 500 MB free hard disk space • USB 2.0/3.0 or serial interface • Screen resolution: 1280 x 1024 pixels Version (language): Single licence on CD-ROM de/en/es/fr

Position	Quantity	Description

WorldSkills Water Technology-EDS Watermanagement

Pos. 13 | 1,00

Station

8024504

Picture similar

Water purification station

Function

The station represents a basic logic function of water treatment in the form of a water storage system with an overflow rim. A groundwater tank with a submersible pump is required for operation. Focal points include:

- Setting flow rate values for volume control
- Level measurement via analog pressure measurement
- Level sensing via capacitive proximity sensors

The training documents reveal how a flocculation reaction is implemented by adding a flocculant, and how sedimentation can occur in spite of the flow.

Drinking water and chlorine

Chlorine is used worldwide to preserve drinking water. Over-metering not only increases the plant operator's costs unnecessarily, it also pollutes the environment and endangers the consumers. The additional chlorine package with manual metering technology is a 1:1 training scenario for online chlorine measurement. This allows you to learn how to operate a chlorine metering system, and react to malfunctions and optimize the system.

The station is fully assembled, wired and tested.

Including software for a free recording of measurement data, PC interface for receiving analog measurements and digital signals, connecting cables, accessory set and a "getting started" user guide.

Main components

3 l tank, including an overflow rim, capacitive proximity sensor, float switch, impeller flow sensor, pressure sensor , 2/2-way solenoid valve, non-return valve, electric connection board, aluminum profile plate.

Note

For single operation, a water supply tank/ground water is required.

General training content

- Controlling, regulating and monitoring physical variables such as levels, flows and pressure
- Technical/physical functions of sensors and actuators as well as wiring, adjustment and parameterization
- Analysing controlled systems, parameterizing and optimizing regulators
- System operation, maintenance, troubleshooting and repair
- Plant engineering
- Optimization and energy monitoring
- Electronic data processing

Learning content for project work

Position	Quantity	Description
		• Function of an overflow rim • Analog level measurement via a pressure sensor • Capacitive proximity sensor for level querying • Basic processes of precipitation, flocculation and sedimentation **Training content with water supply tank** • Activation of a pump for flow control • Regulation variants with capacitive sensors for level control **Training content with additional chlorine package** • Measuring chlorine content • Effects of excessive or insufficient chlorine metering **Technical data** • Water (10 – 15 l) • Power supply: 24 V DC • 3 digital inputs • 3 digital outputs • 4 analog inputs • 1 analog output • Dimensions (H x W x D): 355 x 1100 x 400 mm **Recommended training media** • Water treatment workbook • Monitoring, Control and Optimization Workbook • Energy Optimization Workbook • eLearning course Open- and Closed-Loop Control • eLearning course Process Automation • Water supply technology training set • Sewage technology training set Water purification station
Pos. 14	1,00	**Station** 8024503 Water supply tank/ground water **Function** The water supply tank acts as a simulated water source and is the start and finishing point of a water circuit, while also functioning as intermediate water storage. In this specific case, ground water is simulated as a water source. **Main components** • Systainer® with T-LOC system (tank capacity: 30 l) • Pipe connection adapter • Submersible pump • Prefilter • Float switch  Picture similar

Position	Quantity	Description
		• Water sieve • Mobile dolly truck **Actuators** • 1 submersible pump (24 V DC, safe for unlubricated operation up to 2 hours, max. delivery rate: 10 l/min, max. delivery pressure: 0.5 bar) **Sensors** • 1 float switch (height-adjustable, for protection against unlubricated pump operation) **Filter system** • 1 stainless steel wire mesh insert (flexible, square mesh, stainless steel wire, mesh size: 0.25/0.16 b = 1000 for separating the wastewater (granulate)) • Large in-line filter (with ½" x ½" sight glass, material: PP, sight glass: PA, filter cartridge: 0.2 mm mesh size, pressure: max. 10 bar, flow rate: 55 l/min at 0.5 bar, prevents particles from entering the inlet) **Mechanical system** • The filter system for separating contamination must be attached to the top of the container as a removable drawer system. The filter unit must be designed with a flange plate for nine plug-in pipe returns with an outside diameter of 15 mm. • Container made of ABS plastic, colour: RAL 7035 light grey, 30 l capacity, stackable, mobile, rollers easily removable as frame. Dimensions: H420 x W400 x D300 mm. Water supply tank/ground water
Pos. 15	1,00	**Power pack** 162417 **Tabletop power supply unit** • Input voltage: 85 – 265 V AC (47 – 63 Hz) • Output voltage: 24 V DC, short-circuit-proof • Output current: max. 4.5 A • Dimensions: 75 x 155 x 235 mm Type: Connector as per CEE 7/VII for DE, FR, NO, SE, FI, PT, ES, AT, NL, BE, GR, TR, IT, DK, IR, ID  Picture similar

Position	Quantity	Description
Pos. 16	1,00	**Accessories** 8025419 Optional chlorine measurement package Optional extension for the water treatment station: Measurement of free chlorine. This package is equipped with a dropping funnel, a membrane-covered, amperometric measuring cell and an indicator that can be parameterised. The measuring cell functions within an operating range of 4 to 9 pH.  Picture similar
Pos. 17	1,00	**Meas. device** 573261 DC wattmeter The first step towards discovering potential savings involves measurement of power consumption. The DC wattmeter is a smart meter for training facilities with a 24 V DC power supply and up to 120 W power consumption. All measured values can be read out via data transmission with the integrated Ethernet port. Power consumption is read out as an analogue signal within a range of either 0 to 10 V DC or 4 to 20 mA.  Picture similar
Pos. 18	1,00	**Carriage** 8039990 Trolley with plate Stable sheet steel construction with table plate. Dimensions (W x H x D including rollers to bottom edge of profile plate): 700 x 770 x 700 mm  Picture similar

Position	Quantity	Description
Pos. 19	1,00	**Tool** 539767 **Tool set** The tool set is an aid to easy working on stations. A practical mini-systainer includes: • 200 mm steel rule • Open-jawed spanners size 7, 8, 9, 10 • Adjustable spanner • Side cutter • Insulation-stripping pliers • Wire end sleeve pliers • Screwdriver set, hex, 1.5 – 6 • Screwdriver, hex, 0.9; 1.3 • Screwdriver, cross-head, PZ02 – short • Screwdriver, flat, 2.5 x 75; 4.0 x 100 • Screwdriver, flat, 1.2 – 1.6 • Tubing cutter • Fiber-optic cable cutter • Workpiece, red, black, silver • 100 x cable binders 2.5 x 100 • 100 x wire end sleeves 0.25 • 100 x wire end sleeves 0.75  Picture similar
Pos. 20	1,00	**Pipe/tub cutter** 7658 Pipe and tubing cutter For plastic and Perbunan tubing with and without fabric reinforcement with outside diameters up to 20 mm. Ensures a vertical, burr-free cut through positive locking of tubing in the cutter. It also has a safety clip to prevent unauthorized opening. Supplied with two spare blades.  Picture similar

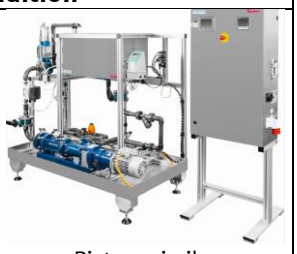
Position	Quantity	Description
Pos. 21	1,00	**Teachware** 8027887 **EDS Water Management – Water purification: Workbook** EDS Water Management is a modular training system which represents the core processes of a water and wastewater treatment plant in the form of a water loop from the source to the wastewater treatment plant and back again. After having worked through the exercises in the "Water purification" workbook, learners will be able to: • control the basic processes of precipitation, flocculation and sedimentation • measure the chlorine content and deal with chlorine dosage in the system • name problems caused by too high or too low a chlorine dosage All workbooks contain: • Sample solutions • Training notes • Worksheets for learners • Multimedia CD-ROM with graphics M. Groß, C. Klippstein, P. Maurer, Y. Salazar, T. Schwab, K. Treffry-Goatley, J. Voortman, C. Wehlers Issue 2014, 82 pages, colour, in folder. Campus licence: en  Picture similar
Pos. 22	1,00	**Teachware** 8027891 **EDS Water Management – Monitoring, controlling and optimizing operations: Workbook** EDS Water Management is a modular training system which represents the core processes of a water and wastewater treatment plant in the form of a water loop from the source to the wastewater treatment plant and back again. After having worked through the exercises in the "Monitoring, controlling and optimizing operations" workbook, learners will be able to: • Control the level using a two-point controller and a linear controller • Control the flow rate using a proportional-integral controller • Understand the features of different controller types and reliably implement the controllers • Identify the impacts of different controller settings on energy consumption • Find the best control strategy for ventilation All workbooks contain:  Picture similar

Position	Quantity	Description
		• Sample solutions • Training notes • Worksheets for learners • Multimedia CD-ROM with graphics M. Groß, Y. Salazar, T. Schwab, J. Strittmatter Edition 2014, 110 pages, colour, in folder. Campus licence: en
Pos. 23	1,00	**Teachware** 8027892 **EDS Water Management – Energy optimization in water and wastewater treatment plants: Workbook** EDS Water Management is a modular training system which represents the core processes of a water and wastewater treatment plant in the form of a water loop from the source to the wastewater treatment plant and back again. After having worked through the exercises in the "Energy Optimization in Water and Wastewater Treatment Plants" workbook, learners will be able to: • Recognize the difference in energy consumption between a free and narrow piping system • Identify potential for energy savings and energy conversion in water and wastewater treatment plants • Compare different control strategies with regard to their energy requirements in order to optimize the efficiency of plant components • Calculate the costs of different control strategies • Implement energy management processes and methods All workbooks contain: • Sample solutions • Training notes • Worksheets for learners • Multimedia CD-ROM with graphics M. Groß, P. Maurer, Y. Salazar, T. Schwab, J. Strittmatter Edition 2014, 186 pages, color, in folder. Campus licence: en

Picture similar

Position	Quantity	Description

WorldSkills Water Technology - EDS Watermanagement Pump Station WorldSkills Edition

Pos. 24	1,00	**Station** 610423 EDS WMGT Pump Station WorldSkills Edition Pumps are the heart of process plants. The station has an eccentric screw pump incl. overheating protection, pump drive 400 AC gear motor, a stainless steel water basin 120 l, stainless steel drip pan the size of the entire plant frame, a piping system with manual valves for fault simulation, pressure/vacuum sensors on the pressure and suction side, bypass line with adjustable safety valve. A pneumatically driven gate valve and butterfly valve are connected to a compressed air accumulator as an energy buffer for emergency operation, The water basin is located above the pump so that a learning situation "Safe working in the pump basement" can be trained. The pump is accessible for recovery with a workshop crane. incl. Padlogs for work safety training "lockout tagout". Stable aluminum profile frame incl. height-adjustable feet for leveling on uneven floors. Suitable for transport with a lift truck, Seperate control cabinet with PLC and operator touch panel, multifunctional frequency converter, intelligent energy monitoring and web-enabled process visualization serves as a learning field for electrical engineering work modeled on Water 4.0.  Picture similar
Pos. 25	1,00	**Replacement Kit Seals** 8176854 Pump station replacement kit seals

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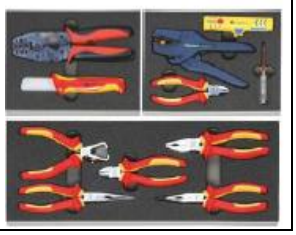
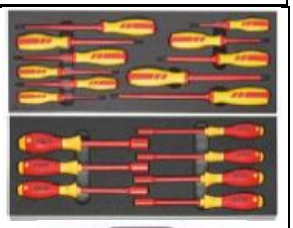
Position	Quantity	Description	
Pos. 26	1,00	11950941 Foldable hydraulic workshop crane With 4 rubber and nylon wheels; Extendable arm in 4 working positions; 360° revolving hook; Two-speed hydraulic pump; Safety valve to avoid any possible overload Technical data: * Capacity: 1000 kg * Arm length: 1170 - 1470 mm * Max. height: 2320 mm	 Picture similar
Pos. 26	1,00	Round slinge Made from polyester (PES) EN 1492-2 with double stitchless protection sleeve and capacity label; PU-starched, thermally fixed; UV-resistant, eliminating material ageing or embrittlement Technical data: * Heat resistant up to +100° C * Moisture-resistant fabric, thus preventing frost damage (up to approx. -40° C) * Length: 4 m * Circumference: 8 m * Capacity: 2000 kg * Thickness / width under load: approx. 6 / 57 mm * Color: Green	 Picture similar
Pos. 26	1,00	Workbench With beech worktop 40 mm thick Legs C-section steel 70x50 mm Technical data: * Width: 2000 mm * Depth: 700 mm * Height: 840 mm * Color: Light grey (RAL 7035)	 Picture similar

Position	Quantity	Description
Pos. 26	1,00	Bench vice Entirely forged from steel, guaranteed unbreakable; Slides forward on opening; Milled case-hardened jaws; Strong lead screw with trapezoidal thread; Adjustable guide; Broad hardened anvil area; Forged pipe clamping jaws Technical data: * Jaw width: 140 mm * Span: 200 mm * Clamping depth: 100 mm Supplied with: Fasteners for attachment to the workbench  Picture similar
Pos. 26	1,00	Tool trolley With scratch-resistant non-slip X-ABS top 2 fixed castors and 2 swivel castors with brake Technical data: * Number of drawers: 5 * Drawer load capacity: 40 kg * Drawer runner extension: 100 % * Drawer runner extension: Anti-tilt lock * Drawer front height: 75; 75; 200; 200; 200 mm * Drawer usable width / depth: 500 / 400 mm * Drawer usable width / depth in G: 20x16 G * Cylinder lock: Modular lock barrel * Hoffmann perforated panel grid interval: 9 x 9 mm * Trolley dimensions (WxDxH): 800 x 500 x 1000 mm * Color: Two-tone powder-coated, silver combined with RAL 7016 anthracite  Tool assortment for tool trolley drawers Supplied in moulded PE rigid foam inlays Content of the drawers: 1st drawer: Measuring tool set: (8x20G) * Vernier caliper - 150 mm - 0,05 mm - depth gauge * Try square - 150x100 mm - DIN 875/2 * Carbide scriber - 155 mm - straight * Flexible steel rule - 300 mm - EG II * Tape measure - 2,5 m - EG II * Plastic folding rule - 2 m - EG III * Spirit level - 400 mm - 0,5 mm / m Marking out and sawing: (8x20G) * Permanent marker - red * Vernier caliper - 150 mm - 0,05 mm - depth gauge * Carbide scriber - 135 mm - straight - with cap * Precision steel rule - 300 mm - EG II * Steel tape measure - 3 m - EG II * Pocket spirit level - 70 mm - 1 mm / m * 1x Hacksaw frame and 10x hacksaw blades  

Position	Quantity	Description
		Torx and hexagon screwdrivers: (8x20) * Hexagon screwdriver - straight - 2 / 2,5 mm * Hexagon ball-point screwdriver - 3 / 4 / 5 / 6 / 8 mm * Screwdriver for Torx - TX6 / TX7 / TX8 / TX9 / TX10 / TX15 / TX20 / TX25 Hammer set: (8x20) * Engineer's hammer - 300 and 500 g * Soft-faced hammer - Ø 40 mm 3rd drawer: Wire stripping tool set: (8x10) * Voltage tester * Side cutter - 140 mm * Cable stripper - 8-13 mm * Wire stripper - 6 mm² Crimping tool / Cable knife set: (8x10) * Crimping plier - 230 mm - 0,5 - 6 mm² * Cable knife - fixed blade - 180 mm Pliers set, fully insulated: (8x20) * Combination plier - 180 mm * Snipe-nose plier - 200 mm * Snipe-nose plier - angeled - 200 mm * Side cutter - 160 mm * Wire stripper - 160 mm Nut spinner set, fully insulated: (8x20) * Nut Spinner - 5,5 / 6 / 7 / 8 / 9 / 10 / 13 mm Electrician's screwdrivers, fully insulated: (8x20) * Electrician's screwdriver for slot-head 2,5 / 3 / 3,5 / 4 / 5,5 / 6,5 / 8 mm * Electrician's screwdriver for Phillips PH0 / PH1 / PH2 / PH3 5th drawer: Empty - for the accommodation of additional tools. Also, for the storage of the below offered hand-held digital multimeter. Hand-held digital multimeter Features: * Data memory; Max/min measurement; Signal measurement; Auto-ranging; etc. Technical data: * Measurement category: CAT IV 600 V / CAT III 1000 V * AC / DC voltage: 1 mV - 1000 V / 0,1 mV - 600 V * AC / DC current: 0.1 µA - 10A * Frequency range: 45 Hz- 1 kHz * Input resistance: 10 MΩ * Resistance: 0,1 Ω - 60 MΩ * Capacitance: 60.00 nF - 60 mF * Temperature: -40 - +1000 °C * Continuity: R < 10 Ω * Display: 5999 Digits * Safety: EN 61010, IEC 61010 * Power supply: 9 V (6F22) Supplied with: * 2x test leads; 2x temperature probe; 1x temperature adaptor; 1x strap; 1x 9 V battery; 1x user manual



Picture similar

Position	Quantity	Description
Pos. 27	1,00	**COMPRESSOR** 91030 **Compressor** Oil-lubricated, very quiet (45 dB (A)) compressor. This makes it ideal for use in classrooms. With pressure reducer and water separator. • Pressure: 800 kPa (8 bar) Pmax • Suction capacity: 50 l/min • Tank volume: 24 l • Compressed air outlet: ¼" or KD4 • Noise level: 45 dB (A)/1 m • Duty cycle: max. 50% • Pressure regulator with gauge Version: 230 V/50 Hz With IEC power socket and IEC power cable to CEE 7/VII suitable for: DE, FR, NO, SE, FI, PT, ES, AT, NL, BE, GR, TR, IT, DK, IR, ID. Version: 120 V/60 Hz With IEC power socket and plug to NEMA 5-15 suitable for: US, CA, Central America, BR, CO, EC, KR, TW, TH, PH, JP. Version: 230 V  Picture similar
Pos. 28	1,00	**Compress.acces.** 102725 Compressor accessories Consisting of: • Coupling socket (KD3-CK-4 and KD4-1/4-A) • Coupling plug (KS4-CK-4) • Tubing (6 x 1 silver 2,5 m)

Position	Quantity	Description

WorldSkillsWater Technology - Magnetic Cards

Pos. 29 | 1,00

Magnetic cards

8174093

Picture similar

Sewage technology training set

How does a wastewater treatment plant work? Playfully explains and demonstrates sewage technology with didactically designed magnet cards, learning card set and catalog of questions. is an innovative interactive training tool for hands-on learning of wastewater processes. All the important stages of wastewater treatment are vividly depicted on 63 magnetic picture cards. On a flipchart or whiteboard, you can quickly and easily reconstruct the complex processes, test your knowledge, or organize group work.

Complete training set consisting of:

- 63 Magnetic picture cards (DIN A6) for presentation on whiteboards. Each card is labeled discretely in English and has space to add the heading term in your language manually.
- User Manual (GB) with list of heading terms for the cards. Heading terms in further languages are available on the DWA product platform.
- 1 Permanent marker to label the cards in your language.
- 1 Workbook “Fit in Wastewater Technology?” with exercises and case studies
- 2 Flashcard sets with 63 picture cards for group work learning and discussion of scenarios.
- 5 Whiteboard markers enable you to draw material flows in your process diagrams.
- 1 high quality transport case.

Extra

You will get access to the DWA (Deutsch Water Association) product platform which contains further information such as video tutorials, videos 360° for exercises with VR glasses and the list of heading terms in further languages.

Position	Quantity	Description

WorldSkills Water Technology - Connected Learning

Pos. 30 | 1,00

ZUGANG CLOUD

8133287

Picture similar

Digital Learning Portal Festo LX

Festo LX - Basic Subscription

Festo LX is our Digital Learning Portal for individual Learning Experiences.

Our cloud-based learning portal offers didactically prepared learning content for many technical areas.

Festo LX is based on multimedia Learning Nuggets that can be combined to form individual Courses and Learning Paths. Courses can thus be adapted very easily and perfectly tailored to the individual needs of teachers and learners.

Festo LX offers a mix of stand-alone courses and learning equipment-based courses to facilitate the hands-on experiments in technical fields. Festo LX has a mapping of the courses with the hardware equipment so you can easily see the courses related to an equipment or the equipment required in a course.

Overview of content on Festo LX

On Festo LX, you will find a variety of learning content for many areas of technical education and professional qualification. From factory automation and fluid power to IIoT and Industry 4.0, electrical engineering, process automation, renewable energies and STEM.

Your license gives you access to more than:

- 250 eLab courses - digital, interactive courses to use in combination with our Festo Didactic learning systems
- 70 eLearning courses to acquire theoretical knowledge without the need for any hardware
- 120 Evaluations for knowledge checks before or after a class
- 80 courses and simulations for Connected Learning with our product lines FACET and Tec2Screen
- 70 Short videos and user manuals
- 300 eBooks, which are PDF versions of workbooks for your learning systems

Functional scope

With your Festo LX Basic subscription you will have access to a variety of Festo LX Contents and the following features:

Position	Quantity	Description
		• Course library to browse and filter all available courses from Festo • Easy creation and editing of individual courses with the LX Creator • User Management: organize individual learners and groups, manage user permissions, assign specific contents • Tracking of learner's progress and success as well as export of learning results • Management and inventory of learning equipment • Availability of learning portal interface as well as contents in various languages • Mobile learning from various devices possible **Individualization of content** With the help of the LX Creator which is included in your license, it is possible to customize Festo Didactic courses according to your needs. You can create custom content from scratch or integrate existing material into Festo LX. You can reuse content from Festo in your own courses to build your personal and individual learning contents. **Content on Festo LX** Our Festo LX Basic Package supports, amongst others, the following topics: Fluid Power: Various courses for the field of pneumatics, electropneumatics, hydraulics, electrohydraulics and mobile hydraulics Electrical Engineering and Electric Power Technology: Various courses for the field of electrical engineering/electronics, electric power circuits, digital electronics, electric drive technology, motor controls and e-mobility Factory and Process Automation: Various courses for the field of mechatronics, sensors and smart sensors, industrial control technology, micro controllers, PLC and fieldbus technology, robotics, process instrumentation and control, and water management Ilot and Industry 4.0: Various courses for the field of digitalization and networking, data security, MES and production planning, energy management and monitoring, Artificial Intelligence, NX/MCD Sustainability: Various courses for the field of energy efficiency, renewable energies, power generation, biologization Metal Working and Mechanics: Various courses for the field of turning, milling, drilling, CNC machining, CAD, dimensional metrology. mechanical drives, piping, wiring

Position	Quantity	Description
		Organization and People: Various courses for the field of lean management, production processes and optimization as well as project management **Licensing and subscription duration** Your license allows you to add an unlimited number of learners to your organization. Content is accessible to the number of learners specified in the license. A license can be withdrawn from one user and assigned to another (transferable license based on course assignments). The number of users and subscription duration of this license is specified below. Once you activate your license in Festo LX, the subscription duration will start. Licenses will not renew automatically. **25 users 1 year** **Conf: LXP-25U-1Y**

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Position	Quantity	Description	Price	Total Price EUR

Remarks:

Pos. 26 only available as a complete package

- Delivery according to availability
- This offer is valid until June 2024.
- Warranty is 24 months as of day of acceptance/delivery.
- The conditions for offer, delivery, payment and software utilization printed in our current catalogue are valid. In case you do not have these, they can be obtained from your contact person. http://www.festo-didactic.com/int-en/ag