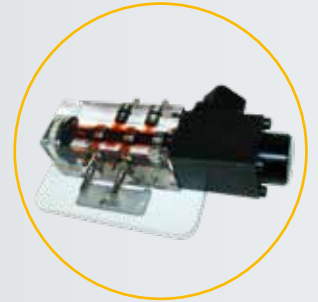


# HYDROMODEL-200

Transparent Hydraulics - Electro-hydraulics

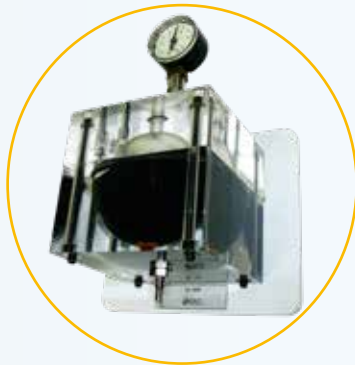
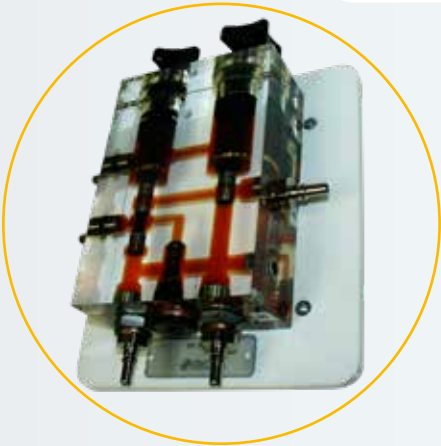
Hydraulic and electro-hydraulic technology at a glance



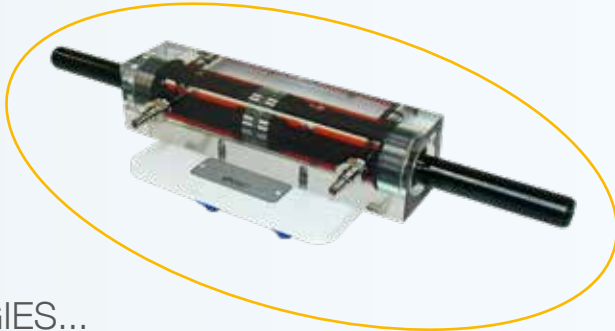
Develop the SKILLS...



Transparent methacrylate body with internal industrial metal parts



Implements and controls hydraulic and electro-hydraulic circuits



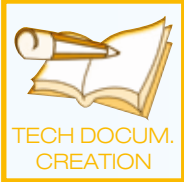
ANALYSIS



TROUBLESHOOTING



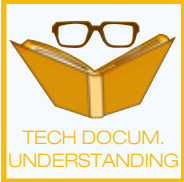
DESIGNING



TECH DOCUM. CREATION



INSTALLATION AND ASSEMBLY



TECH DOCUM. UNDERSTANDING



OPERATION



HYDRAULICS

In the following TECHNOLOGIES...



## ■ HYDROMODEL-200 - Transparent Hydraulics - Electro-hydraulics

HYDROMODEL-200 meets training needs for technology related to hydraulic components in a very visual way.

The parts are made up of a transparent methacrylate body with internal industrial metal parts. Using this system, it is possible to see inside the components as they operate, becoming familiar with them and understanding how they work.



### Hermetic connections



The hoses, as well as the different devices, are connected to each other with a system of quick-fit self-sealing connectors NW4 1/8".

This system guarantees a maximum level of fluid integrity with ZERO LEAKAGE even during connection/disconnection operations.

### Fixing to the panel

Each component includes a fixing system to aid quick and simple preparation of practical exercises.



### Kits

HYDROMODEL-200 has 3 standard kits defined to cover training demands at different educational levels. Users can configure personalised sets to meet their own requirements or add to previously purchased equipment.

STANDARD KITS	
HM9500-XX*	MOD-201: Transparent hydraulic level I kit
HM9501-XX*	MOD-202: Transparent hydraulic level II kit
HM9502-XX*	MOD-203: Transparent electro-hydraulic kit

*\*Reference dependent on socket, voltage and/or language. Further information: Product configurator or How To Order (web).*



■ HYDROMODEL-200 - With this system you could...

HYDROMODEL-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES	
	 HYDRAULICS
SKILLS	 ANALYSIS
	 TROUBLESHOOT.
	 DESIGNING
	 TECH DOCUM. CREATION
	 INSTALLATION AND ASSEMBLY
	 TECH DOCUM. UNDERSTANDING
	 OPERATION

## @ eLEARNING-200

Find out more about the theory behind the technologies developed in HYDROMODEL-200 with our eLEARNING-200 courses.

### RELATED eLEARNING-200 COURSES

Introduction to electricity (SMC-102)

DC electricity (SMC-103)

AC electricity (SMC-104)

Solid state (SMC-105)

Sensors technology (SMC-108)

Hydraulics / electrohydraulics (SMC-111)

*\*See eLEARNING-200 chapter for more information.*



- This shows how the HYDROMODEL-200 is suitable to develop skills in the specific technology.
- This shows that HYDROMODEL-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.



## ■ HYDROMODEL-200 - Extra equipment

There are other products in the range to complement HYDROMODEL-200.

### • autoSIM-200



autoSIM-200 is software that can design and simulate pneumatic, electro-pneumatic, hydraulic circuits, etc. It is also used for programming them plus monitoring and control of pre-defined 2D and 3D models.

*\*See autoSIM-200 chapter for more information.*

## ■ HYDROMODEL-200 - Complete laboratory

Discover our proposal for laboratories and the best combination of the HYDROMODEL-200 and other accessories in the chapter “Product packs”.

## ■ HYDROMODEL-200 - Configuration

Getting the right HYDROMODEL-200 configuration is as easy as:

### • Steps to follow

- 1.- Select the panel and the necessary extras.
- 2.- Select the chosen standard kits or a personalised configuration.
- 3.- In the event of preferring a personalised configuration, select the references chosen for the composition.



## ■ HYDROMODEL-200 - Standard kits

Ref.	Description	KITS		
		201	202	203
<b>Actuators</b>				
HM9412	Double acting cylinder	1		
HM9419	Single acting cylinder		1	
<b>Distribution valves</b>				
HM9413	4/2 directional control valve. Manually operated	1		
HM9431	4/2 solenoid valve, spring return			1
HM9440	4/3 solenoid valve with closed mid-position			1
<b>Pressure control valves</b>				
HM9414	Pressure relief valve (ball valve), direct control	1		
HM9418	3 way pressure relief valve, with damping		1	
HM9420	Pressure reducing valve, 3 way. Direct control		1	
<b>Flow valves</b>				
HM9422	Manual shut-off valve, 2 way		1	
HM9423	Piloted check valve		1	
HM9415	One way restrictor	1		
HM9416	Two way flow control valve	1		
HM9421	One way flow control valve		1	
HM9424	Flow control valve with pressure compensation		1	
<b>Connection parts and accessories</b>				
HM9425	Set of 5 hoses		1	
HM9408	Set of 10 hoses	1		
HM9405	6 connection distributor on manifold	1		
HM9407	4 connection divider		1	
HM9406	Cross distributor with pressure gauge	1		
<b>Control modules, sensors and electrical accessories</b>				
HY9040-XX*	Power supply			1
HY9042	Set of pushbuttons			1
HY9041	Set of 3 relays			1
HM923	Electric end of stroke (right)			1
HM9231-00-0008	Electric end of stroke (left)			1
HY9272	Set of connectors + cable for solenoids			1
HY9046	Set of cables with electric connector 4 mm			1
<b>Didactic support</b>				
HM9DAF-XX*	User's and practical manual	1	1	1

\*Reference dependent on socket, voltage and/or language. Further information: Product configurator or How To Order (web).

⚠ DON'T FORGET TO ADD AN ASSEMBLY PANEL, HYDRAULIC UNIT AND EXTRAS	
PN4064	Vertical mounting panel for 2 work posts
PN4065	Rolling table with twin-post
HM9410-XX*	Portable hydraulic pump for transparent hydraulic
PN4074	Storage drawer blocks for rolling table with lock





## ■ HYDROMODEL-200 - Customized kits

The available hydraulic and electro-hydraulic components are listed below, by category.

### Assembly panel, hydraulic unit and extras



#### PN4064 - Vertical mounting panel for 2 work posts

- External dimensions: 1150x760x410mm\*. Allows work to be carried out on both sides, optimizing investment and space.

*\*Other dimensions available on request.*

#### PN4065 - Rolling table with twin-post

The entire rolling frame system may be disassembled for transportation.

-The vertical panel means you can work on both sides.

Panel dimensions: 1150x760x25mm

- It has a work-top for horizontal work, 1200x800mm.

The lower section features a 1200x600mm metal shelf containing the component storage drawers block, the portable hydraulic pump, etc.

4 wheel support, 2 of them with brake and 2 without brake, and high loading output.

Total dimensions: 1200x800x1700mm.



#### HM9410-XX\* - Portable hydraulic pump for transparent hydraulic

- Transparent tank holding 6 litres.

- Gear pump. Q= 1 l/min.

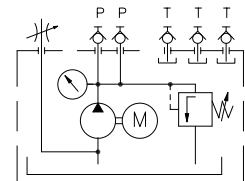
- Pressure relief valve, Pmax: 10 bar.

- 3 quick connector couplings (P + 2T)

- Single-phase motor. Start - stop switch. Filter cap and filter.

- Air bubble insertion system in the circulation oil.

*\* Does not include oil drum. HM9411 necessary.*



#### PN4074 - Storage drawer blocks for rolling table with lock

- Compact 4-drawer block with slide guides to house the components.

- External dimensions: 500x725x650mm.

- With security lock.



#### RAW012 - Oil with special red colouring

- Specially coloured oil for using with transparent elements.

- Quantity required for portable hydraulic pump.

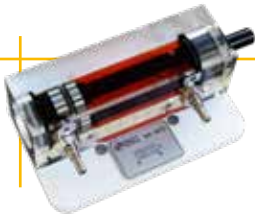
#### Didactic support

HM9DAF-0X\*- User's and practical manual

HY9DAT-0X\* - Theoretical concepts manual

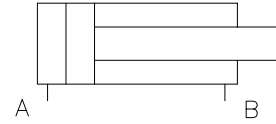


## Actuators

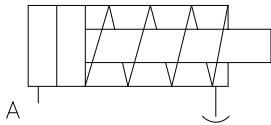


**HM9412 - Double acting cylinder**

- $\varnothing 20/\varnothing 10 \times 58$ mm of stroke.
- Max. Pressure: 10bar.



**HM9419 - Single acting cylinder**



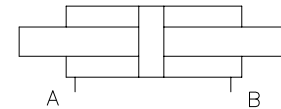
- $\varnothing 20/\varnothing 10 \times 40$ mm of stroke. Spring return.
- Max. Pressure: 10bar.



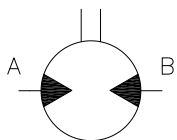
**HM9457 - Double rod cylinder**



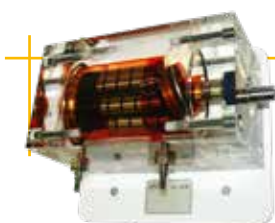
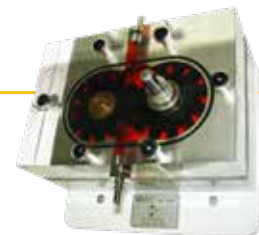
- $\varnothing 14/\varnothing 20/\varnothing 14 \times 100$ mm of stroke.
- Max. Pressure: 10bar.



**HM9401 - External gear motor**

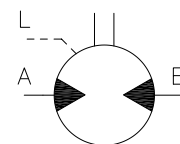


- Two-way hydraulic motor, with external gears.
- With two gears with 12 teeth and one shaft.

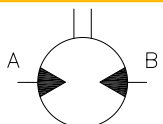


**HM9436 - Axial piston motor**

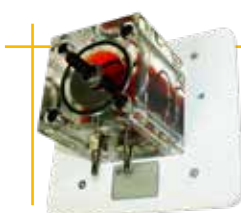
- Two-way hydraulic motor with axial pistons.
- 7 metal pistons  $\varnothing 12$  over inclined plane.
- Connections A, B and L drainage.



**HM9435 - Vane motor**

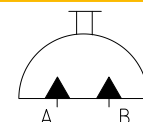


- Two-way vane hydraulic motor with one shaft. 8 vanes acting on eccentric rotor.



**HM9438 - 180° rotary actuator**

- Oscillating two-way hydraulic motor.
- Angle of rotation: 180°. One shaft.

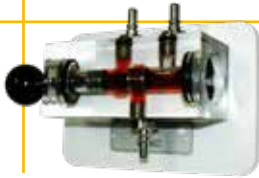


\*Reference dependent on socket, voltage and/or language. Further information: Product configurator or How To Order (web).

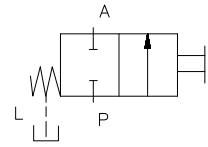


Distribution valves

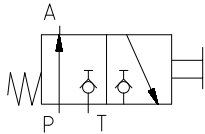
HM9442 - 2/2 directional control valve. Manually operated



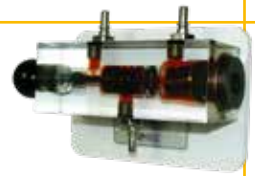
- Manually-operated and spring return.
- With drainage.



HM9445 - 3/2 directional control valve. Manually operated. Seat type



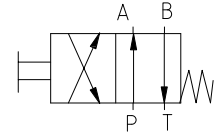
- Manually-operated and spring return.
- Max. Pressure: 10bar.



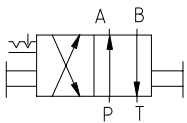
HM9413 - 4/2 directional control valve. Manually operated



- Manually-operated and spring return.
- Max. Pressure: 10bar.



HM9446 - 4/2 directional control valve. Manually operated. Mechanical interlocking



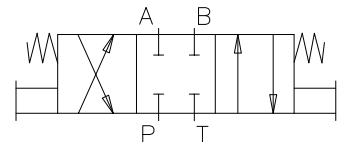
- Manual operation on both sides.
- Max. Pressure: 10bar.



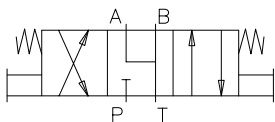
HM9447 - 4/3 directional control valve. Manually operated. Closed mid-position



- Manual operation on both sides and spring centered.
- Max. Pressure: 10bar.



HM9449 - 4/3 directional control valve. Manually operated. Relieving mid-position



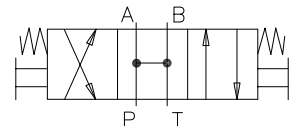
- Manual operation on both sides and spring centered.
- Max. Pressure: 10bar.



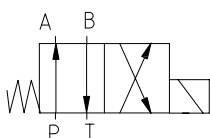
HM9450 - 4/3 directional control valve. Manually operated. P-A-B-T linked in mid-position



- Manual operation on both sides and spring centered.



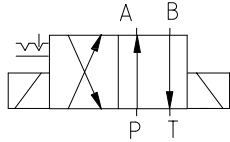
HM9431 - 4/2 solenoid valve, spring return



- Coil-operated and spring return.
- Max. Pressure: 10bar. Low consumption coil (12w).
- \*Connector for HM9272 coil required.



### HM9482 - 4/2 solenoid valve with mechanical interlocking



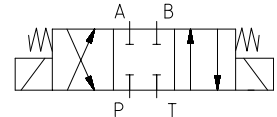
- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).
- \*Connector for HM9272 coil required.*



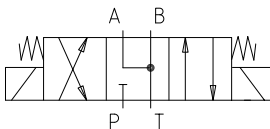
### HM9440 - 4/3 solenoid valve with closed mid-position



- Coil-operated on both sides and spring centered.
- Max. Pressure: 10bar. Low consumption coil (12w).
- \*Connector for HM9272 coil required.*



### HM9483 - 4/3 solenoid valve. A-B-T linked in mid-position



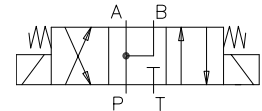
- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).
- \*Connector for HM9272 coil required.*



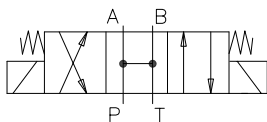
### HM9484 - 4/3 solenoid valve. A-B-P linked in mid-position



- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).
- \*Connector for HM9272 coil required.*



### HM9485 - 4/3 solenoid valve. A-B-P-T linked in mid-position



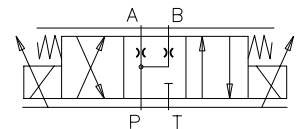
- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).
- \*Connector for HM9272 coil required.*



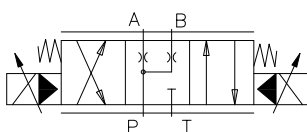
### HM9403 - 4/3 proportional directional control valve, direct control.



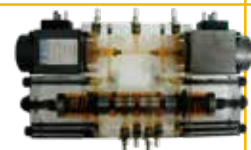
- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal.
- A, B and P connected in mid-position. T closed.
- Coil-operated on both sides. Spring centered.
- Max. Pressure: 10bar. 24Vcc / I nominal: 0.8A coils.
- \*Connector for HM9303 coil required.*



### HM9404 - 4/3 proportional directional control valve.



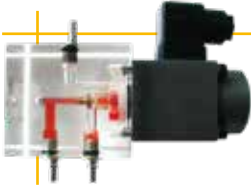
- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal, with a principal stage and another pilot stage.
- Pilot-operated. External pilots X and Y. Spring centered. A, B and P connected in mid-position. T closed.
- Coil-operated on both sides.
- Max. Pressure: 10bar. 24Vcc / I nominal: 0.8A coils.
- \*Connector for HM9303 coil required.*



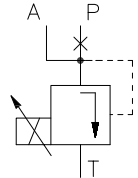


Pressure control valves

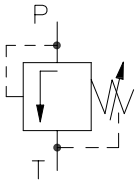
HM9402 - Proportional pressure relief valve, direct control



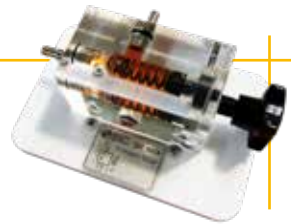
- Regulates the maximum pressure value at a point using an electric control signal.
- Coil-operated 24Vcc / I nominal: 0.8A.
- Max. Pressure: 10bar.
- \*Connector for HM9303 coil required.



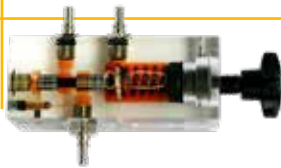
HM9414 - Pressure relief valve (ball valve), direct control



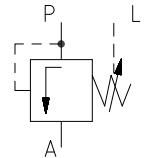
- It enables the maximum pressure value at the input to be adjusted, unloading to the tank from the adjusted value.
- Manual adjustment using the twist handle.
- Max. Pressure: 10bar.



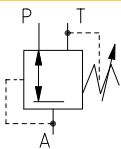
HM9418 -3 way pressure relief valve, with damping



- Opens the oil flow when the preset pressure value is reached at the input.
- Direct control. Manual adjustment by rotary knob.
- Max. Pressure: 10bar.



HM9420 - Pressure reducing valve, 3 way. Direct control



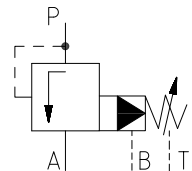
- It enables the pressure value at the output, at A, to be adjusted.
- Manual adjustment by rotary knob.
- Max. Pressure: 10bar.



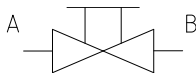
HM9459 - Pressure relief valve. Pilot operated



- Two-stage limiter valve, one pilot and the and other principal. It can work as a sequence valve, opening from P to T when P reaches the pressure value set.
- Manual regulation by rotary knob.
- Max. Pressure: 10bar.



HM9422 - Manual shut-off valve, 2 way



- Opens or closes the oil flow with an activation lever.
- Manual rotary actuation.
- Max. Pressure: 10bar.

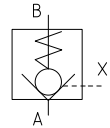


## Flow valves

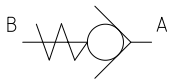


**HM9423 - Piloted check valve**

- Normally it allows the oil to pass in one direction only, but it does it in both directions when there is pressure in the pilot connection.
- Max. Pressure: 10bar.



**HM9415 - One way restrictor**

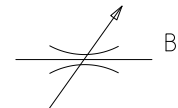


- It enables the oil to flow on one direction only.
- Max. Pressure: 10bar.

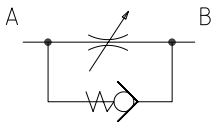


**HM9416 - Two way flow control valve**

- It enables the oil flow in both directions to be adjusted.
- Two-way flow control valve, with two ports, needle adjustment by rotary knob.
- Max. Pressure: 10bar.



**HM9421 - One way flow control valve**

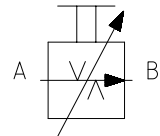


- It enables the oil flow in one direction to be adjusted and flow to be unrestricted in the opposite direction.
- One-way. Manual adjustment by rotary knob.
- Max. Pressure: 10bar.

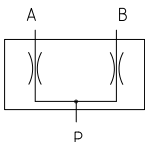


**HM9424 - Flow control valve with pressure compensation**

- It enables the flow to be adjusted regardless of the pressure values at the input and output.
- Manual regulation by rotary knob.
- Max. Pressure: 10bar.



**HM9468 - Flow divider**

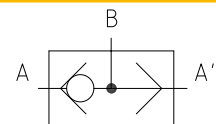


- Flow divider valve: it divides the inlet flow into two equal parts.
- Max. Pressure: 10bar.



**HM9469 - Circuit selector with logic function "OR"**

- Max. Pressure: 10bar.





Connection parts and accessories



- Set of 5 transparent polyurethane tubes.
- Max. Pressure: 10bar. 520 mm length.

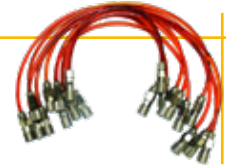
HM9425 - Set of 5 hoses



HM9408 - Set of 10 hoses

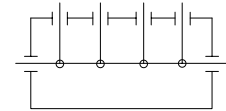


- Set of 10 transparent polyurethane tubes.
- Max. Pressure: 10bar. 520 mm length: 6 units. 350 mm length: 4 units.

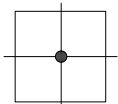


HM9405 - 6 connection distributor on manifold

- Max. Pressure: 10bar.



HM9407 - 4 connection divider



- Max. Pressure: 10bar.
- With three self-sealing plugs and 1 socket.

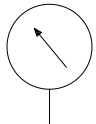


HM9406 - Cross distributor with pressure gauge

- Distributor with 3 connections with pressure gauge from 0 to 16 bar.
- With two self-sealing plugs and 1 socket.



HM9461 - Pressure gauge without container

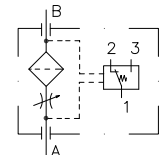


- Without box or scale for viewing the internal mechanism.
- Max. Pressure: 10bar.
- With one self-sealing plug and one socket.

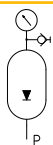


HM9462 - Pressure filter with clogging indicator

- Oil filter to fit at the high pressure input of the user circuit.
- Potential-free output by switched contact.
- Max. Pressure: 10bar.



HM9464 - Piston accumulator

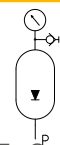


- Max. Pressure: 10bar.
- Load pressure (nitrogen): 4 bar.



HM9466 - Diaphragm accumulator

- Max. Pressure: 10bar.
- Load pressure (nitrogen): 4 bar.



\*Reference dependent on socket, voltage and/or language. Further information: Product configurator or How To Order (web).

## Control modules, sensors and electrical accessories

### HY9309-XX\* - Power supply module for two proportional coils



- Potentiometer for controlling the output intensity to coils a or b.
- I max. = 0.9 A per coil.
- Overload electronic internal protection.
- Dither frequency on/off switch and Dither frequency value adjustment.
- 2 ammeters for displaying the current via coils a or b.

### HY9303 - Set of connectors for proportional coils

- Connectors with LED indicators (screen type). Long. 1.5 m.
- It includes 2 units (1 grey connector and 1 black connector).
- Indication on screen of light intensity proportional to the intensity value.



### HY9040-XX\* - Power supply

- Voltage input 110V - 240VAC.
- Output: 24VDC / 5A.
- Short-circuit protection.
- Input switch and LED display.
- Built-in power cable.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

### HY9042 - Set of pushbuttons

- 2 pushbuttons with spring return.
- 2-position selector.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.



### HY9041 - Set of 3 relays

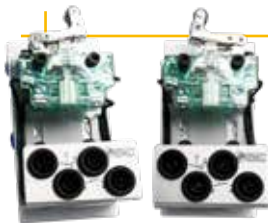
- It includes three relays with coil 24V and 4 switchable contacts.
- LED activated relay display.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

### PN4441 - Benchtop HMI module - Siemens KTP-700

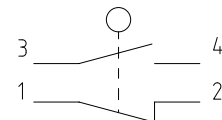
- Benchtop module or for panel which includes a Siemens KTP700 Basic HMI
- Screen: 7 inch TFT display.
- Resolution: 800 x 480 pixel (horizontal x vertical).
- Ports: 1 USB & 1 Ethernet.



### HM9231 / HM9231-00-0008 - Electric end of stroke (right / left)



- Retractable roller driven.
- R=right. L=left.
- 1 contact NO. 1 contact NC.
- Transparent body and roller with reversible position.
- 4 mm female safety connectors.



### HY9272 - Set of connectors + cable for solenoids

- Male connectors 4 mm. Cable 1.5 m.
- Ready to connect in solenoid valve coils.
- It includes 3 units (1 black connector and 2 grey connectors).
- LED indicators.



### HY9046 - Set of cables with electric connector 4 mm

- 5 red cables 1.5 m.
- 5 black cables 1 m.
- 10 yellow cables 0.5 m.
- 5 blue cables 0.25 m.

