

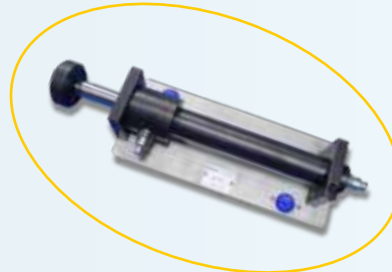
# HYDROTRAINER-200

Hydraulics - Electro-hydraulics

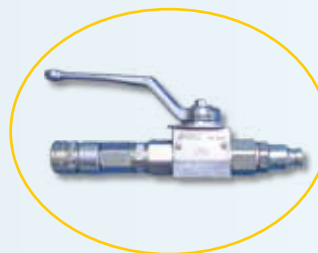
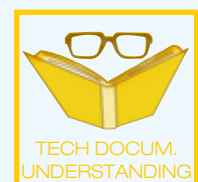
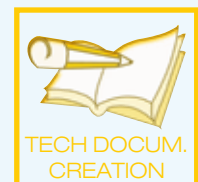
Hydraulics and electro-hydraulics within your reach



Develop the SKILLS...



Implements and controls hydraulic  
and electrohydraulic circuits



Industrial components  
on panel fastening plate

From basic hydraulics  
to proportional  
electro-hydraulics



In the following TECHNOLOGIES...





### ■ HYDROTRAINER-200 - Hydraulics - Electro-hydraulics

Hydraulic drives continue to be used in numerous applications in automated industry. With HYDROTRAINER-200 you will be able to meet all your training requirements in the technology related to these drives.

Designed using top-quality industrial materials it has everything required in order to start working from the very first day.

#### Table / moving assembly frame

The moving frame within the HYDROTRAINER-200 system has a double sided assembly panel with tables sufficiently large for performing practical work at ease on either sides.

It is assembled on four wheels, two of which have a brake, which enables moving and holding it in the classroom simply and comfortably.

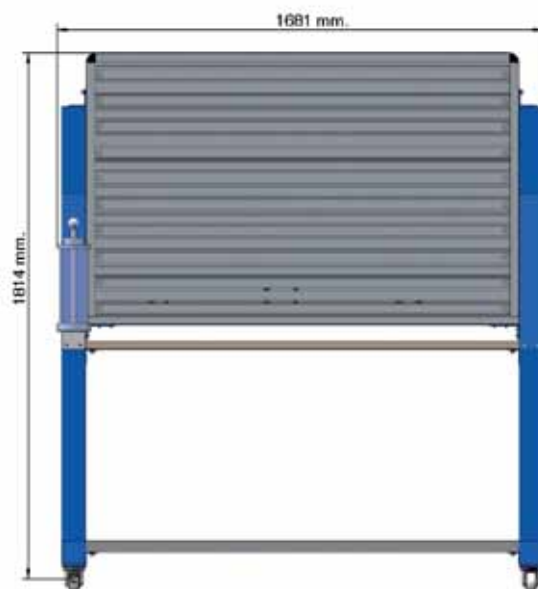
It includes a glass for volumetric measurements on each side of the panel.

The lower section has a support shelf for holding the hydraulic powerpack and storage drawers for components.



#### Dimensions

HYDROTRAINER-200 has a large enough design for working at ease. The measurements are given in mm below.



## Hermetic connections

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

This system guarantees a maximum level of tightness whereby ZERO DRIPPING occurs even during connection/disconnection operations.



## Fixing to the panel



Each component includes a fixing system devised in such a way as to aid the quick and simple preparation of the practical exercises.

## Kits

HYDROTRAINER-200 has 5 standard kits defined to cover training requirements at different educational levels. Also, the user can configure personalised sets to meet their needs or complement a previously purchased kit.

STANDARD KITS	
SAI9506	HYD-201: Hydraulics level I kit
SAI9507	HYD-202: Hydraulics level II kit
SAI9508	HYD-203: Electro-hydraulics kit
SAI9511	HYD-206: Proportional hydraulics: level I kit
SAI9512	HYD-207: Proportional hydraulics: level II kit





## ■ HYDROTRAINER-200 - With this system you could...

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

TECHNOLOGIES	
SKILLS	HYDRAULICS
	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 HYDROTRAINER-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*



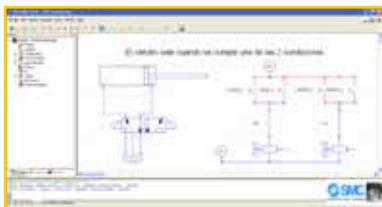
- This shows how the HYDROTRAINER-200 is suitable to develop skills in the specific technology.
- This shows that HYDROTRAINER-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.



## ■ HYDROTRAINER-200 - Extra equipment

There are other products in the range to complement HYDROTRAINER-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.*

## ■ HYDROTRAINER-200 - Complete laboratory

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

## ■ HYDROTRAINER-200 - Configuration

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

### • Steps to follow

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





## ■ HYDROTRAINER-200 - Standard kits

HYD-201: Hydraulics level I kit  
 HYD-202: Hydraulics level II kit  
 HYD-203: Electro-hydraulics kit  
 HYD-206: Proportional hydraulics: level I kit  
 HYD-207: Proportional hydraulics: level II kit



		HYD KITS				
Ref.	Description	201	202	203	206	207
Actuators						
SAI9239	Double-acting cylinder		1			
SAI9225	Double-rod cylinder					1
SAI9210	Double-acting differential hydraulic cylinder	1				
SAI9300	Cylinder with transducer for linear analogue position					1
SAI9230	Counterweight with lateral fixing to the panel		1			
SAI9220	Hydraulic motor		1			1
Pressure control valves						
SAI9202	Pressure relief valve	2				
SAI9279	Pressure relief valve with fixing to the panel rail. Sequence valve		1			
SAI9218	Pilot-operated pressure relief valve. Sequence valve		1			
SAI9219	3-way pressure reducing valve		1			
SAI9301	Proportional pressure relief valve, direct control				1	
SAI9305	Pilot-operated proportional pressure relief valve					1
Flow valves						
SAI9204	Shut-off valve with scale	1				
SAI9205	Two way flow control valve	1				
SAI9211	Non-return line valve	1				
SAI9203	Non-return choke valve	1				
SAI9208	Pressure compensated one-way non-return valve	1				
SAI9213	Piloted non-return valve	1				
Distribution valves						
SAI9217	Distribution valve 2/2	1				
SAI9282	Distribution valve 3/2	1				
SAI9212	Distribution valve 4/2	1				
SAI9214	4/3 Manual acting valve, spring centered	1				
SAI9253	Distribution valve 2/2 roller driven		1			
SAI9224	Distribution solenoid valve 4/2			1		
SAI9226	Distribution solenoid valve 4/3			1		
SAI9302	Proportional distribution valve 4/3				1	
SAI9304	Pilot-operated proportional distribution valve 4/3				1	
SAI9308	Proportional distribution valve 4/3 with position sensor					1

Ref.	Description	HYD KITS				
		201	202	203	206	207
Connection parts and accessories						
SAI9216	Set of 12 hoses with quick-fit female connectors	1				
SAI9240	Set of 10 hoses with quick-fit female connectors		1			
SAI9206	Cross distributor	1				
SAI9207	T distributor with pressure gauge	2				
SAI9209	Distributor plate with pressure gauge, 4 outlets	1	1			
SAI9221	Membrane accumulator with safety block		1			
SAI9233	Set of tubes for load losses simulation	1				
Control modules, sensors and electrical accessories						
SAI9040	Power supply			1		1
SAI9042	Set of pushbuttons			1		1
SAI9101	Electrical inputs one push-button			1		
SAI9041	Set of 3 relays			1		2
SAI9046	Set of cables with electric connector 4 mm.			1		1
SAI9272	Set of connectors + cable for solenoids			1		
SAI9231	Electric end of stroke			3		4
SAI9229	Pressure switch			1		
SAI9271	Cable for pressure gauge			1		
SAI9309	Power supply module for two proportional coils				1	
SAI9303	Set of connectors for proportional coils				1	1
SAI9310	Digital amplifier cards PZD-PWD for proportional coils					1
SAI9311	Generator of external setpoints					1
SAI9312	Tachometer					1
SAI9313	Analogue position transducer for motor					1
SAI9314	Pressure transducer with digital indicator					1
Didactic support						
SAI9552	Hydraulics Electro-hydraulics. User's and practical manual	1	1	1		
SAI9563	Proportional Hydraulics level I. User's and practical manual				1	
SAI9565	Proportional Hydraulics level II. User's and practical manual					1

**⚠ DON'T FORGET TO ADD AN ASSEMBLY PANEL, HYDRAULIC UNIT AND EXTRAS**

SAI9280	Hydraulic rolling table with double face panel	SAI9260	Set of drawers with lock
SAI9274	Hose support accessory (x2)	SAI9370	Benchtop frame with dual position panel
SAI9256	Hydraulic pump for one workstation	SAI9371	Measuring cup for benchtop frame SAI9370
SAI9261	Hydraulic pump for two workstations	SAI9372	Hose accessory (x1) for benchtop frame SAI9370





### ■ HYDROTRAINER-200 - Customized kits

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

#### Assembly panel, hydraulic unit and extras



##### **SAI9280 - Hydraulic rolling table with double face panel**

- The vertical panel means you can work on both sides.
- External panel dimensions: 1500x940x25 mm
- It includes a coated white top for horizontal work, 1500 x 800 mm.
- The lower section features a 1500x800 mm metal shelf containing two component storage drawer blocks and the hydraulic pump.
- 4-wheel support, two of them with brake.
- Total dimensions: 1681x800x1814 mm.
- Includes 2 measuring cups.

#### Hydraulic pump

##### **SAI9256 - Hydraulic pump for one workstation**

##### **SAI9261 - Hydraulic pump for two workstations**

Maximum operation pressure: 60 bar.

70 litres metal oil tank.

Gear pump flow rate: 5,5 l/min

It includes required oil, P and T connection blocks, emergency stop and start – stop push buttons.

External dimensions: 530x800x580 mm.



##### **SAI9260 - Set of drawers with lock**

- 3-drawer block with slide guides to house components.
- Lockable with key.
- External dimensions: 440x800x550mm.

##### **SAI9274 - Hose support accessory (x2)**

- Stainless steel made, the set includes two units, one for each side of the panel (for trolley SAI9280).
- It is equipped with lateral fixing system to the panel.





### SAI9370 - Benchtop frame with dual position panel

- The vertical panel means you can work on both sides.
- External panel dimensions: 1500x940x25 mm
- Includes lateral structure manufactured in steel prepared for affixing accessories such as: load simulator weight, measuring cup and hose accessories.
- Total dimensions: 1584x600x1084mm.

### SAI9371 - Measuring cup for benchtop frame SAI9370

- The measuring cup is a transparent container of 1.2 litres, scaled and with an anti-overflow system.
- Includes a pipe that connects the measuring cup with the hydraulic tank.



### SAI9372 - Hose accessory (x1) for benchtop frame SAI9370



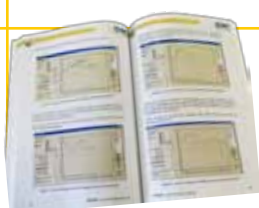
- It is equipped with lateral fixing system to the panel.
- Stainless steel made.

### SAI9131 - Platform with wheels for the hydraulic motor

- Platform composed of base frame with 4 wheels, 2 with and 2 without brakes, to support the hydraulic motor.

\* Recommended for users of SAI9370 - Benchtop frame with dual position panel.

### Didactic support

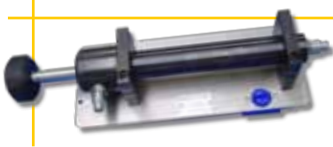


- SAI9552 - Hydraulics Electro-hydraulics. User's and practical manual
- SAI9553 - Theoretical concepts manual
- SAI9563 - Proportional Hydraulics Level I. User's and practical manual
- SAI9565 - Proportional Hydraulics Level II. User's and practical manual

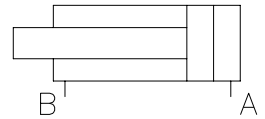


## Actuators

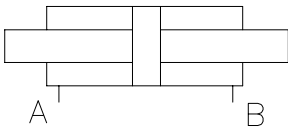
### SAI9239 - Double-acting cylinder



- In steel,  $\varnothing 32/\varnothing 16 \times 200$  mm stroke.
- Area ratio 1.33:1.
- It includes two quick-fit male connectors R 1/4".
- Includes threaded cam at the end of the rod.



### SAI9225 - Double-rod cylinder



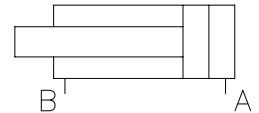
- In steel,  $P_{max.} = 150$  bar.
- Diameter  $\varnothing 16 \times \varnothing 32 \times \varnothing 16 \times 300$  mm stroke.
- It includes two quick-fit male connectors R 1/4".
- Includes threaded cam at the end of the rod.



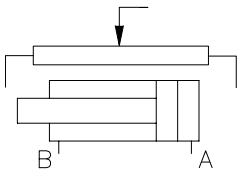
### SAI9210 - Double-acting differential hydraulic cylinder



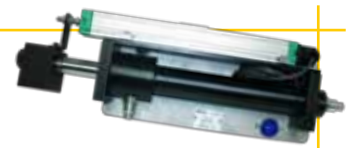
- In steel,  $\varnothing 32/\varnothing 22 \times 200$  mm stroke.
- Includes threaded cam at the end of the rod.
- It includes two quick-fit male connectors R 1/4".



### SAI9300 - Cylinder with transducer for linear analogue position



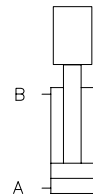
- Linear actuator with position capture.
- Diameter 32mm. Stroke: 200mm.
- Resistance  $R = 5 \text{ K}\Omega$ .
- With cables and 4 mm security terminals. Cable length: 1,5 m.
- It includes two quick-fit male connectors R 1/4".



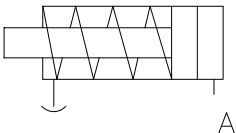
### SAI9230 - Counterweight with lateral fixing to the panel



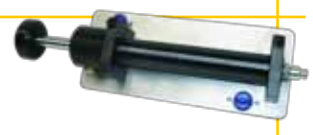
- With lateral fixing system to the panel.
- Weight: 18kg.
- Double-acting cylinder  $\varnothing 20/\varnothing 12 \times 150$  mm stroke.
- It includes transparent methacrylate screen for safety.
- It includes two quick-fit male connectors R 1/4".



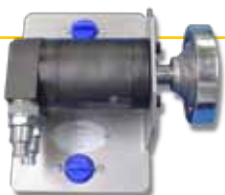
### SAI9245 - Single acting cylinder



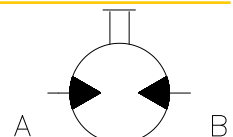
- Steel construction,  $\varnothing 32/\varnothing 16 \times 160$  mm stroke
- Includes threaded cam at the end of the rod.
- It includes one quick-fit male connectors R 1/4".



### SAI9220 - Hydraulic motor



- Gerotor system. Cubic capacity:  $12.5 \text{ cm}^3/\text{rev}$ .
- With steering wheel mounted on the axis.
- Includes two quick-fit male connectors, R 1/4" and fixing system to the assembly panel.

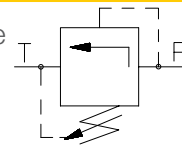


## Pressure control valves

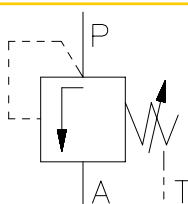
### SAI9202 - Pressure relief valve



- It enables the maximum pressure value at the input to be adjusted, unloading to the tank from the adjusted value.
- Direct control.
- Pressure regulation 2÷64 bar.
- It includes quick-fit male connectors R 1/4".



### SAI9279 - Pressure relief valve with fixing to the panel rail. Sequence valve

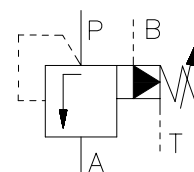


- Opens the oil flow when the preset pressure value is reached at the input.
- Direct guide control with damping.
- Control pressure: 2÷64 bar.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

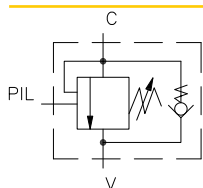


### SAI9218 - Pilot-operated pressure relief valve. Sequence valve

- Two-stage limiter valve, one pilot and the other principal. It can work as a sequence valve, opening from P to A when P reaches the pressure value set.
- Indirect guide control.
- Control pressure: 2÷64 bar.
- On base plate with 4 quick-fit male connectors, R 1/4".
- Standardised valve TN6.



### SAI9223 - Overcentre valve

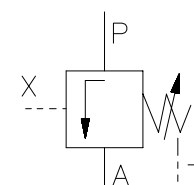


- Compensates the load which is moving the actuator.
- Load control valve. Manual adjustment.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.

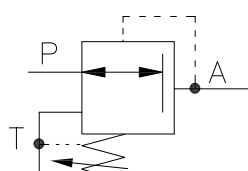


### SAI9283 - Pilot actuated pressure relief valve

- Opens the oil flow when the preset pressure value is reached at the pilot.
- Pressure regulation: 2÷64bar.
- Maximum flow rate: 25 l/min.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.



### SAI9219 - 3-way pressure reducing valve



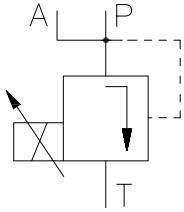
- It enables the pressure value at the output, at A, to be adjusted.
- Direct control.
- Pressure regulation 2÷64 bar.
- With relief function as well.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.





## Pressure control valves

### SAI9301 - Proportional pressure relief valve, direct control



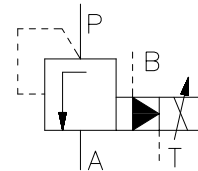
- Regulates the maximum pressure value at a point using an electric control signal.
- Direct control.
- Max. Pressure: 105bar.
- Proportional coil for 0-0,8 A.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.
- \*A connector for SAI9303 proportional coil is required.*



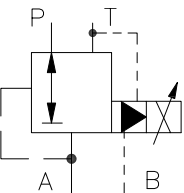
### SAI9305 - Pilot-operated proportional pressure relief valve



- Regulates the maximum pressure value at a point using an electric control signal. It has a principal stage and another pilot stage.
- Pressure regulation 0÷64 bar.
- Qmax. = 60 l/min.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.
- \*A connector for SAI9303 proportional coil is required.*



### SAI9318 - Proportional pressure reducing valve. Pilot operated



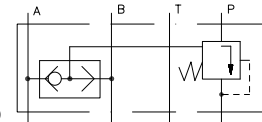
- Reduces the pressure value at a point using an electric control signal.
- Attending to the flow direction this valve may work as a pressure relief valve: P → A: pressure reducing valve. A → T: pressure relief valve.
- Pressure regulation: 0÷64bar. With pre-activation chamber.
- Maximum flow rate: 40 l/min.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Adjustment using a proportional coil. Standardised valve TN6.
- \*A connector for SAI9303 proportional coil is required.*



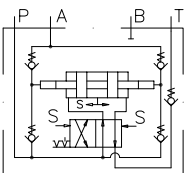
### SAI9259 - Differential valve - Pressure compensator



- It enables the flow passing through a proportional valves to be independent of the pressure value at the input and output.
- Modular assembly under TN6 size directional control valve.
- ΔP: 5bar.
- Constant flow rate due to the pressure balance between P and A or P and B.



### SAI9242 - Pressure intensifier 1:4 with piloted by-pass check valve



- Multiplies the value of the pressure signal by four.
- Piloted non-return valve included for by-pass function.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.



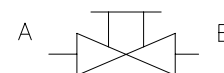


## Flow valves

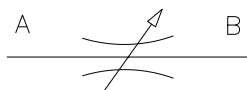
### SAI9204 - Shut-off valve with scale



- Opens or closes the oil flow with an activation lever on a graduated scale.
- Scale from 0 to 90°.
- One quick-fit male connector and one quick-fit female connector, R 1/4".



### SAI9205 - Two way flow control valve



- It enables the oil flow in both directions to be adjusted.
- Manual adjustment by rotary control.
- One quick-fit male connector and one quick-fit female connector, R 1/4".



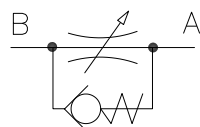
### SAI9211 - Non-return line valve



- It enables the oil to flow on one direction only.
- One quick-fit male connector and one quick-fit female connector, R 1/4".
- Mounted in a hose.



### SAI9203 - Non-return choke valve



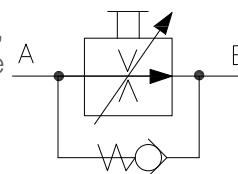
- It enables the oil flow in one direction to be adjusted and flow to be unrestricted in the opposite direction.
- Manual adjustment by rotary control.
- One quick-fit male connector and one quick-fit female connector, R 1/4".



### SAI9208 - Pressure compensated one-way non-return valve



- It enables the oil flow in one direction to be adjusted, regardless of the pressure value at the input and output, while unrestricted flow is permitted in the opposite direction.
- Manual adjustable via graduated scale.
- Nominal flow rate: 3,2 l/min.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.



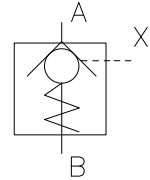


## Flow valves

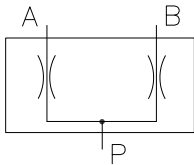


### SAI9213 - Piloted non-return valve

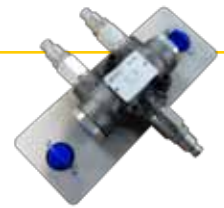
- Normally it allows the oil to pass in one direction only, but it does it in both directions when there is pressure in the pilot connection.
- With internal drainage.
- Cartridge type, for line assembly.
- Two quick-fit male connectors and one quick-fit female connector, R 1/4".



### SAI9222 - Flow divider valve



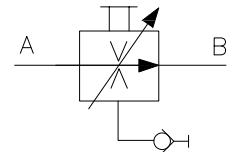
- This valve divides the input flow in two equal parts.
- Nominal flow rate: 6l/min.
- Maximum flow rate: 38 l/min.
- With male anti-leakage quick-fit connectors R1/4".



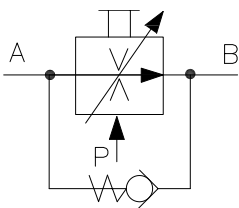
### SAI9262 - 2 way pressure compensated flow control valve with "minimess" connection



- It enables the flow to be adjusted regardless of the pressure values at the input and output, in addition incorporating an auxiliary connection to measure the pressure.
- 2 way flow control valve. Hydrostatic compensation. "Minimess" connection.
- Nominal flow rate: 3,2 l/min.
- Manually adjustable via graduated scale.
- Standardised valve TN6.



### SAI9247 - 3 way pressure compensated flow control valve



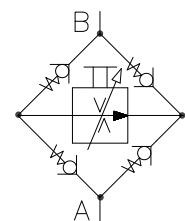
- It enables the flow to be adjusted regardless of the pressure values at the input and output.
- Flow control valve. Hydrostatic compensation. 3 way. Externally piloted.
- Nominal flow rate: 3,2 l/min.
- Manually adjustable via graduated scale.
- Standardised valve TN6.



### SAI9250 - Pressure compensated flow control valve with rectifier module



- It enables the flow to be adjusted regardless of the pressure values at the input and output, incorporating a rectifier to regulate the flow that enters and leaves the actuator.
- 2 way flow control valve. Hydrostatic compensation. "Minimess" connection. Rectifier circuit including four non-return valves for bidirectional operation.
- Nominal flow rate: 3,2 l/min.
- Manually adjustable via graduated scale.
- Standardised valve TN6.

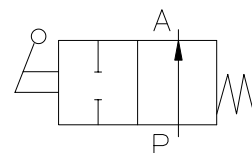


## Distribution valves

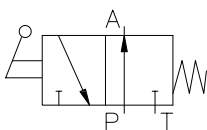


**SAI9217 - Distribution valve 2/2**

- Manual drive. Spring reset. Normally opened.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



**SAI9282 - Distribution valve 3/2**

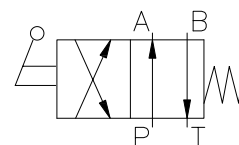


- Manual drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

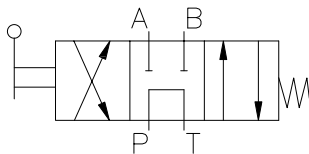


**SAI9212 - Distribution valve 4/2**

- Manual drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



**SAI9214 - 4/3 Manual acting valve, spring centered**

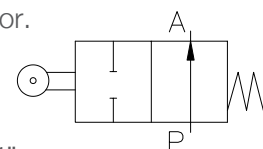


- Manual drive. Spring reset. P and T connected in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

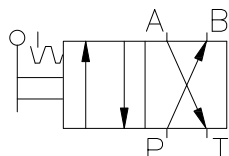


**SAI9253 - Distribution valve 2/2 roller driven**

- Distributor valve 2/2 for operation from an external actuator.
- Roller driven. Spring reset.
- Normally open.
- Includes cam and accessories for cylinder assembly.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



**SAI9243 - 4/2 directional control valve, with mechanical interlock**



- Bistable distributor valve 4/2
- Mechanical locking manual override.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



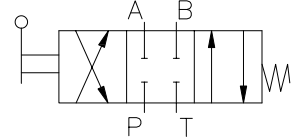


## Distribution valves

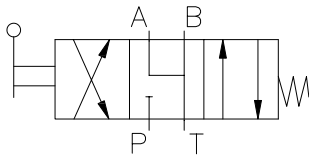


### SAI9215 -4/3 directional control valve. Manually operated. Closed mid-positions

- Lever operated valve. Spring centered. A, B, P and T closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



### SAI9241 - 4/3 distribution valve. A, B, T linked in mid-position

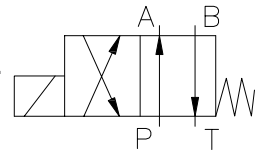


- Lever operated valve. Spring-centered. A, B and T connected in central position. P closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

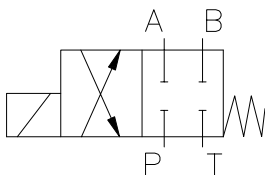


### SAI9224 - Distribution solenoid valve 4/2

- Electric drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.
- \*Connector for SAI9272 coil required.*



### SAI9273 - 4/2 solenoid valve with closed mid-position

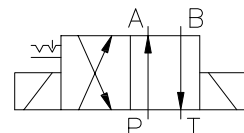


- 4 lines closed at rest.
- Electric drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.
- \*Connector for SAI9272 coil required.*

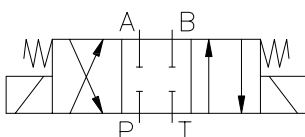


### SAI9275 - 4/2 solenoid valve, with mechanical interlocking

- Mechanical interlock. Electrically operated in both sides, biestable.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.
- \*Connectors for SAI9272 coil required.*



### SAI9226 - Distribution solenoid valve 4/3



- Electric drive and spring centring.
- Closed centre.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.
- \*Connectors for SAI9272 coil required.*

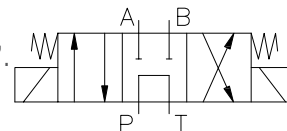




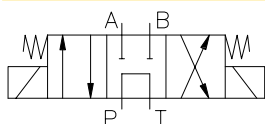
### SAI9227 - 4/3 solenoid valve with relieving mid-position

- Electrically operated. Solenoids and spring centered. A-B-T linked. P closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

*\*Connectors for SAI9272 coils required.*



### SAI9228 - 4/3 solenoid valve with PT-connected in mid-position



- Electrically operated: 24VDC solenoids and spring centered. P-T linked. A-B closed in central position.
- Mounted on anodized aluminium base plate with three male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.

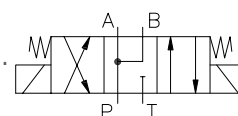
*\*Necesarios conectores para bobinas SAI9272.*



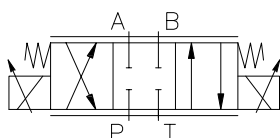
### SAI9281 - 4/3 solenoid valve, A-B-P linked. T closed in mid-position

- Electrically operated. Solenoids and spring centered. A-B-P linked. T closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

*\*Connectors for SAI9272 coils required.*



### SAI9302 - Proportional distribution valve 4/3



- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal.
- Direct control, spring centring. Closed centres.
- Nominal flow rate: 6 l/min.
- Pmax. = 315 bar.
- Coils at 24V, 0~0.85 A.
- On base plate with 4 quick-fix male connectors, R 1/4".
- Standardised valve TN6.

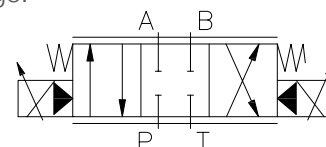
*\*Connectors for SAI9303 coils required.*



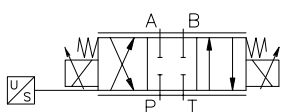
### SAI9304 - Pilot-operated proportional distribution valve 4/3

- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal, with a principal stage and another pilot stage.
- Indirect control, spring centring. Closed centres.
- Pmax. = 210 bar.
- Coils at 24V, 0~0.85 A. Internal X and Y drivers
- On base plate with 4 quick-fix male connectors, R 1/4".
- Rated size 10 (TN10).

*\*Connectors for SAI9303 coils required.*



### SAI9308 - Proportional distribution valve 4/3 with position sensor



- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal. It incorporates position capture of the internal slide.
- Direct control. Spring centring. Closed centres.
- Nominal flow rate: 6 l/min. Pmax. = 315 bar.
- With LVDT runner position sensor
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

*\*Connectors for SAI9303 coils required.*







## Connection parts and accessories

### SAI9216 - Set of 12 hoses with quick-fit female connectors



- 8 pieces NW6 x 500 mm long.
- 4 pieces NW6 x 1000 mm long.



### SAI9240 - Set of 10 hoses with quick-fit female connectors

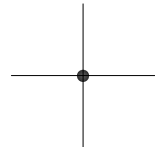


- 8 pieces NW6 x 500 mm long.
- 2 pieces NW6 x 1000 mm long.

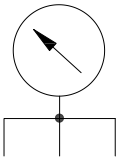


### SAI9206 - Cross distributor

- Multiple derivation of oil flow with 4 connections.
- 4 exits at 90°.
- With three quick-fit male connectors and one female R 1/4".



### SAI9207 - T distributor with pressure gauge

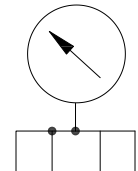


- 3 port pressure gauge.
- Pressure gauge ø63, 0÷60 bar.
- Glycerine damping.
- 3 exits at 90°, two quick-fit male connectors and one female R 1/4".

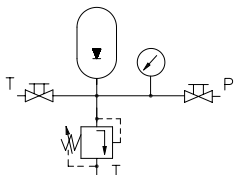


### SAI9209 - Distributor plate with pressure gauge, 4 outlets

- 4 port pressure gauge.
- Diameter pressure gauge ø63, 0÷60 bar, on base plate.
- Glycerine damping.
- With four quick-fit male connectors, R 1/4".



### SAI9221 - Membrane accumulator with safety block



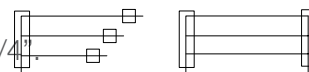
- T.U.V. type including two shutoff valves and safety valve tared above the working level.
- Charged with nitrogen, P load: 20 bar.
- It includes two quick-fit male connectors R 1/4".
- Volume: 0.7 dm<sup>3</sup>.



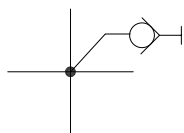


#### SAI9233 - Set of tubes for load losses simulation

- To measure pressure drops
- It includes two quick-fit male connectors R 1/4"
- 3 different diameters with the same length.
- 3 different lengths with the same diameter.



#### SAI9254 - Cross distributor with minimes connection

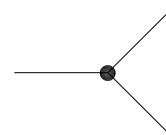


- 4 port distributor plus another auxiliary connection
- Four 90° connections and measurement point for "minimes" hose.
- 4 anti-leakage quick-fit connectors included, R 1/4", 3 male and 1 female.

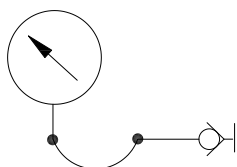


#### SAI9255 - "Y" distributor

- 3 port distributor.
- With three Y connections.
- Includes two male quick connectors and a female R 1/4" connector.



#### SAI9252 - Pressure gauge with "minimes" connection

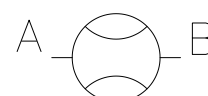


- Pressure gauge with auxiliary pressure tap.
- Manometer ø63mm, P: 0÷100 bar.
- Glycerine damping.
- 500 mm length hose included. "Minimes" connector included.



#### SAI9238 - 1 - 9 l/min flow-meter

- Measurement range: 1 – 9 l/min.
- Transparent body with scale.
- Male and female anti-leakage quick-fit connectors, R 1/4".





## Control modules, sensors and electrical accessories



**SAI9040 - 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.

**SAI9042 - Set of pushbuttons**

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



**SAI9101 - Electrical inputs one push-button**

- 1 pushbutton with spring return.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

**SAI9041 - 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.



**SAI9046 - 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.

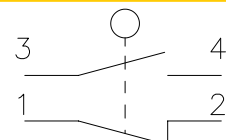
**SAI9272 - Set of connectors + cable for solenoids**

- 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.



**SAI9231 - Electric end of stroke**

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



**SAI9043 - Indicator light assembly**

- Includes 8 indicator lights and a beeper.
- It has additional female sockets for power supply distribution.
- 4 mm female electrical safety connectors.





### SAI9033 - Electric meter with pre-selection

- Includes counting and countdown inputs.
- Power supply: 24 V.
- Pre-selected electromechanics.
- Manual or electric zero clear.
- Switched contact
- 4 mm female electrical safety connectors.

### SAI9057- Set of 2 timed relays

- Installed in box made of an insulating material with a system for securing to the support panel and ISO serigraph.
- Includes two timed relays: one for connection and the other for disconnection.
- With 24 V coil and switch contact.
- It has an LED timer state indicator.
- Programmable time between 0.1 sec and 1 hour.
- 4 mm electrical safety connections.



### SAI4-2143 - MicroPLC

- Module for table mounting or panel, including the Alpha2 AL2-24MR-D controller (15 inputs and 9 outputs to relay).
- Includes simulation of analog / digital inputs.
- Includes 24Vdc power supply.
- Programming software and instructions manual.
- Includes LED output activation indicator.
- Power supply: 100-240Vac.
- Built-in power cable.

### Benchtop PLC module\*

#### SAI9367 - Benchtop Siemens PLC module

- Benchtop module or for panel which includes a Siemens S7-1200 (1212C CPU) PLC with 8 digital inputs, 6 digital outputs to relay and 2 analogue inputs.

#### SAI9121 - Benchtop Allen Bradley PLC module

- Benchtop module or for panel which includes an Allen Bradley Micrologix 1100 PLC with 10 digital inputs, 6 digital outputs to relay and 2 analogue inputs.



- All the inputs and outputs are accessible by female quick connection sockets for cables with 4 mm safety terminals.
- Includes simulation of analogue and digital inputs by potentiometers and switches.
- Includes LED output activation indicator.
- Includes 24Vdc power supply.
- Power supply: 100-240Vac.

\* **Programming tools not included. See section "Programming tools".**

\* **Consult for other PLC brands.**

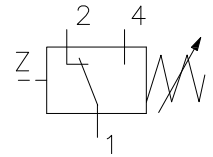


## Control modules, sensors and electrical accessories



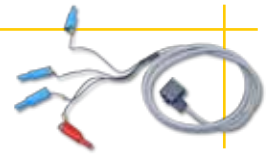
### SAI9229 - Pressure switch

- It emits an electrical signals when the preset pressure value is reached.
- Output via switched potential-free contact.
- Pressure adjustable between 0 - 40 bar. Max. Pressure: 125bar.
- \*Cable for SAI9271 pressure switch required.*



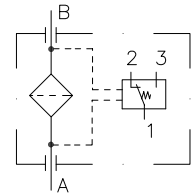
### SAI9271 - Cable for pressure gauge

- Ready to connect to pressure switch.
- Male connectors  $\varnothing 4$  mm.
- Cable length: 1.5 m.
- LED indicators.

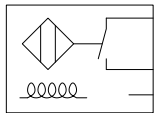


### SAI9287 - In line pressure filter

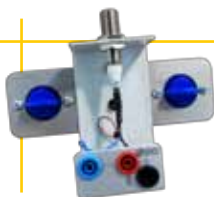
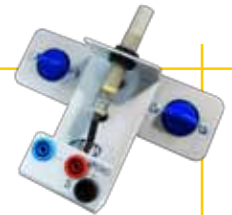
- Oil filter to fit at the high pressure input of the user circuit.
- 10  $\mu$  cartridge. B10=75. Max. Pressure: 10 bar.
- With electrical clogging indicator.
- Includes electrical connector with two LEDs (red, green) and output switched by free voltage contact.
- On base plate with three quick-fit male connectors R 1/4".



### SAI9276 - Inductive sensor

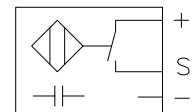


- Adjustable detection distance: 2 mm.
- M12, possibility of adjusting the detection distance.
- Transistorised output, with indicator LED.
- Three socket safety wiring on screen printed plate for correct connection.

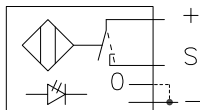


### SAI9277 - Capacitive sensor

- Adjustable detection distance: 4 mm.
- M12, possibility of adjusting the detection distance.
- Transistorised output, with indicator LED.
- Three socket safety wiring on screen printed plate for correct connection.



### SAI9278 - Optical sensor



- Adjustable detection distance: 100 mm.
- M18, possibility of adjusting the detection distance.
- Transistorised output, with indicator LED.
- Four socket safety wiring on screen printed plate for correct connection.



### SAI9309 - Power supply module for two proportional coils



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



### SAI9303 - 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).

### SAI9310 - Digital amplifier cards PZD-PWD for proportional coils

- Electronic unit for entering the electric signals to the proportional valves. Automatic control.
- For the control and regulation of systems with proportional solenoid valves.
- Controlled by microprocessor without potentiometers, input, reading and graphic display of parameters by PC. Internal and external set point introduction possibility.
- Acceleration / deceleration slopes.
- PID digital regulator.
- $\varnothing 4$  mm security terminals.
- 1 Software license included for PC. 1 communication cable included (PC – card).

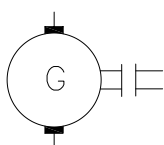


### SAI9311 - Generator of external setpoints



- Electronic unit for entering the electric control setpoint to the digital amplifier cards SAI9310.
- With multi-turn potentiometer, output current  $0 \sim \pm 10$  VDC.
- In screen printed insulating box, with connections by means of  $\varnothing 4$  mm coloured safety sockets.

### SAI9312 - Tachometer



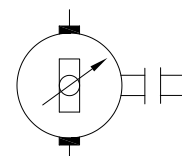
- For mounting on the motor and obtaining a voltage value in proportion with the rotation speed (speed control).
- Output  $0 \sim \pm 10$  VDC. Bidirectional.
- With coupling for piston motor SAI9220.
- $\varnothing 4$  mm security terminals.



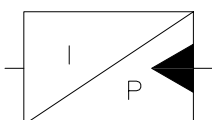
### SAI9313 - Analogue position transducer for motor



- For mounting on the motor and obtaining a voltage value in proportion to the rotation angle. (Position control).
- Output  $0 \sim 10$  VDC. Bidirectional.
- $R = 4.7 \text{ K}\Omega$ .
- With coupling for piston motor SAI9220.
- $\varnothing 4$  mm security terminals.



### SAI9314 - Pressure transducer with digital indicator



- Converts the pressure value at any point into a proportional electrical signal (V).
- Pressure range =  $0 \sim 64$  bar.
- Output  $4 \sim 20$  mA.
- Built-in pressure switch function.

