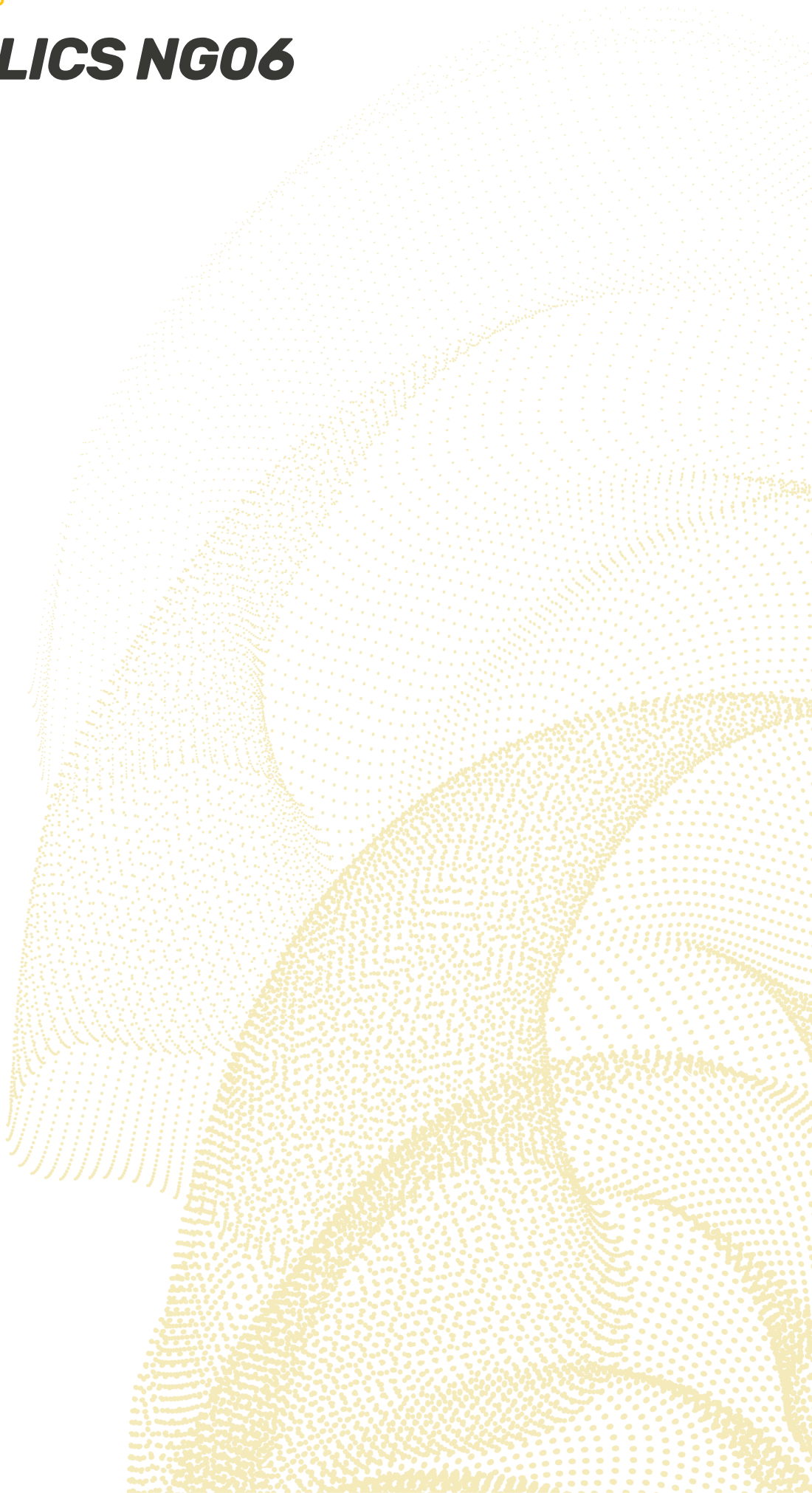


TRAINING SYSTEMS

# **HYDRAULICS NG06**

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**HRE**  
Automation



HRE Automation takes advantage of its industrial experience of more than 40 years in industrial automation and fluids, using it as a technological base to create equipment and educational systems that are perfectly suited to the demands of today's industrial market.

In the continuous search for excellence in teaching equipment, we are a company specialized in providing means for optimal training in the field of automation.

Offers:

- PRACTICE EQUIPMENT
- PEDAGOGICAL SUPPORT (TEACH WARE)
- PERSONALIZED ATTENTION

The teacher will be able to impart with ease and clarity, a quality theoretical-practical teaching. At the same time, it contributes to rapid learning by students, using equipment that will later be used in the work environment.

***HRE***  
**Automation**

**HRE Automation**

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<http://www.hre.es>



**HYDRAULICS – INDUSTRIAL NG06 SYSTEMS**

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**Hydraulic Training Trolley HLA80**

**HLA80-1/HLA80-2**

Especially designed to training in hydraulics, electro and proportional hydraulics, featuring:

- Dimensions: 1594 x 850, 1936 mm (high).
- Metal structure painted in dark grey color, with 4 wheels, 2 of them are lockable.
- Metal working panel of 1350x1050 mm. With Ø17mm holes every 50mm (horizontally and vertically) for clamping hydraulic components without using any additional tool. Metal panel with Epoxi plastic paint covering, RAL 7035, to guarantee a long useful life in perfect condition. Upper frame for mounting electrical elements and other elements. **(Available with one panel HLA80-1 or with two panels HLA80-2)**
- Big fixed metal tray with plate grid under the panels to collect any eventual leak of oil. Directly connected to the oil deposit of the hydraulic power unit.
- Transparent device with graduated scale and anti-overflow system for volumetric measurements, one by working side
- 2 Pressure connections and 4 return connections at each working side
- Hydraulic power unit with fixed flow pump 5 l/min **(HLA80-2 with double pump and HLA80-1 with single pump)**. 1.2KW single-phase motor with capacitor start and start/stop button. With 30 liter tank mounted on the bottom of the bench structure with anti-vibration.
- Emergency button at each working side, to cut down electrical and hydraulic power supply.
- 3 sockets 220 Vac (or 110 Vac) at each side. 2P+T, 16 Amp.
- Just one single-phase plug for the hydraulic power unit and the electrical sockets
- **Drawers cabinet/Storage pyramid (optionals)**. Drawers or pyramid for each working position, for storing components. Cabinet with three drawers, central locking with key and safety protection (a single drawer can be opened at the same time). Each drawer has a metal tray to fix the elements. Metal pyramid similar to the panel
- 30 liters oil, HLP 32, and maintenance manual are included



**HLA80-2 with 2 cabinets of drawers**



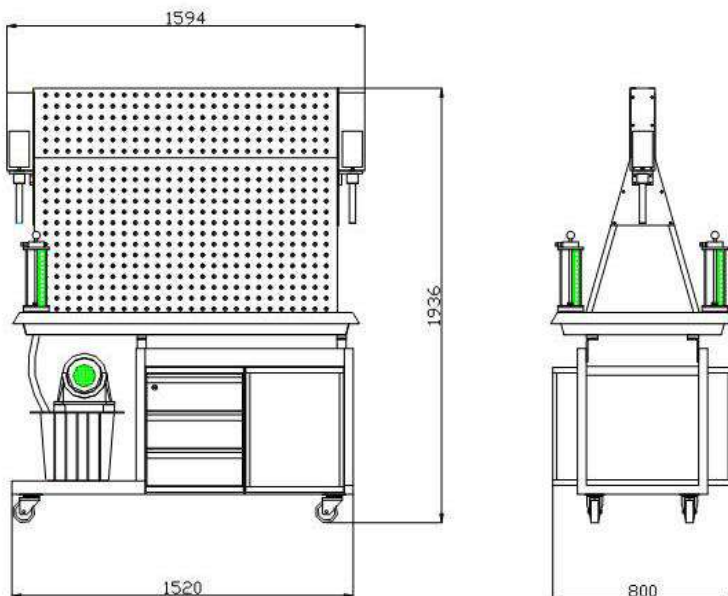
**HLA80-1 with 1 cabinet of drawers and 1 pyramid**

## HYDRAULIC POWER UNIT:

- Assembled onto the metal structure, under the panels, incorporate shake absorbers to avoid noise.
- Internal gear pumps. 5 liters /min (HLA80-1 one pump and HLA80-2 two pumps)
- Noise level 60 db - 1 meter
- Oil reservoir of 30 liters, with oil level viewfinder, air inlet filter and oil return filter
- Pressure relief valve with pressure gauge by pump, independent pressure regulation, The HLA80-2 trolley has a tandem motor with 2 pumps, the HLA80-1 trolley has a tandem motor with 1 pump.
- Single –phase electric motor 220 V 50Hz (optionally 110 Vca 50 – 60 Hz or triphasic), 1.2 Kw
- On-Off control box with two push buttons and motor overload protection.
- An emergency push button and a battery of 3 electrical outlets 230 VAC (or 110 VAC). 16 Amp, accessible at each workstation
- A distributor block with 2P and 4T hydraulic connections for each workstation. Self-sealing couplers and shut off ball valve

Every valve size will be NG06 – Cetop 3.

## DIMENSIONS



### Single trolley HLA80-1

Mobile structure with one working panel, one cabinet and one pyramid Hydraulic unit with one fixed flow pump 5l/min

**Ref. 53952010**

### Double trolley HLA80-2

Mobile structure with two working panels, two cabinets and hydraulic unit with two fixed flow pumps 2x5l/min

**Ref. 53952011**

### Drawers' cabinet for trolleys HLA80/70

3 drawers with fixing trays and safety protection with central locking

**Ref. 13026977**

### Storage pyramid for trolleys HLA80/70

Two-sided, metallic with epoxy plastic paint and 17 mm diameter holes

**Ref. 53952014**

**The HLA80-1 trolley's reference include a cabinet and a pyramid,  
The HLA80-2 trolley's reference include two cabinets (Other options upon request)**

**Hydraulic Training Trolley HLA70**

**HLA70-1/HLA70-2**

Especially designed to training in hydraulics, electro and proportional hydraulics, featuring:

- Dimensions: 1176 x 860, 1948 mm (high).
- Metal structure painted in dark grey color, with 4 wheels, 2 of them are lockable.
- Metal working panel of 950x1050 mm. With Ø17mm holes every 50mm (horizontally and vertically) for clamping hydraulic components without using any additional tool. Metal panel with Epoxi plastic paint covering, RAL 7035, to guarantee a long useful life in perfect condition. Upper frame for mounting electrical elements and other elements. **(Available with one panel HLA70-1 or with two panels HLA70-2)**
- Big fixed metal tray with plate grid under the panels to collect any eventual leak of oil. Directly connected to the oil deposit of the hydraulic power unit.
- Transparent device with graduated scale and anti-overflow system for volumetric measurements, one by working side
- 2 Pressure connections and 4 return connections at each working side
- Hydraulic power unit with fixed flow pump 5 l/min **(HLA70-2 with double pump and HLA70-1 with single pump)**. 1.2KW single-phase motor with capacitor start and start/stop button. With 30 liter tank mounted on the bottom of the bench structure with anti-vibration.
- Emergency button at each working side, to cut down electrical and hydraulic power supply.
- On-Off control box with two push buttons and motor overload protection. Just one single-phase plug for the hydraulic power unit
- **Drawers' cabinet/Storage pyramid (optionals)**. Drawers or pyramid for each working position, for storing components. Cabinet with three drawers, central locking with key and safety protection (a single drawer can be opened at the same time). Each drawer has a metal tray to fix the elements. Metal pyramid similar to the panel
- 30 liters oil, HLP 32, and maintenance manual are included

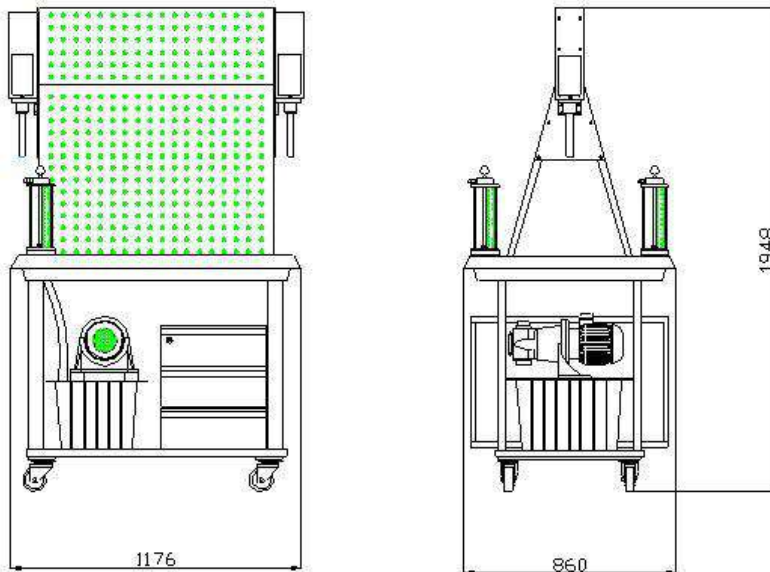


**HLA70-1 including 1 cabinet with 3 drawers**

## HYDRAULIC POWER UNIT:

- Assembled onto the metal structure, under the panels, incorporate shake absorbers to avoid noise.
  - Internal gear pumps. 5 liters /min (HLA70-1 one pump and HLA70-2 two pumps)
  - Noise level 60 db - 1 meter
  - Oil reservoir of 30 liters, with oil level viewfinder, air inlet filter and oil return filter
  - Pressure relief valve with pressure gauge by pump, independent pressure regulation, The HL70-2 trolley has a tandem motor with 2 pumps, the HLA70-1 trolley has a tandem motor with 1 pump.
  - Single -phase electric motor 220 V 50Hz (optionally 110 Vca 50 – 60 Hz or triphasic), 1.2 Kw
  - On-Off control box with two push buttons and motor overload protection.
  - An emergency push button, accessible at each workstation
  - A distributor block with 1P and 2T hydraulic connections for each workstation. Self-sealing couplers and shut off ball valve
- Every valve size will be NG06 – Cetop 3.

## DIMENSIONS:



### Single trolley HLA70-1

Mobile structure with one working panel, one cabinet and hydraulic unit with one fixed flow pump 5l/min

**Ref. 53952012**

### Double trolley HLA70-2

Mobile structure with two working panels, one cabinet, and hydraulic unit with two fixed flow pumps 2x5l/min

**Ref. 53952013**

### Drawers' cabinet for trolleys HLA80/70

3 drawers with fixing trays and safety protection with central locking

**Ref. 13026977**

### Storage pyramid for trolleys HLA80/70

Two-sided, metallic with epoxy plastic paint and 17 mm diameter holes

**Ref. 53952014**

**The HLA70-1 & HLA70-2 trolley's references include one cabinet with 3 the drawers (Pyramid available upon request).**

**Hydraulics level 1**

Ref. 53952015

1



**Double acting differential cylinder**

Ø32 / Ø22, 200 mm stroke.  
Over plate with cam and quick fit connectors  
Ref. 13025799      Units.1

2



**Set of 12 hoses with quick female connectors**

8 hoses NW6 x 600 mm length  
4 hoses NW6 x 1000 mm length  
Ref. 13025794      Units.1

3



**Cross distributor**

4 connection, with quick fit connectors  
Ref. 13026559      Units.1

4



**2 "T" distributor with pressure gauge 0...60 bar**

Glycerin damped, with quick fit connectors  
Ref. 13025792      Units.2

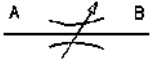
5



**Shut off ball valve**

With graduated scale and quick fit connectors  
Ref. 13025806      Units.1

6



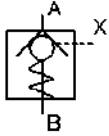
**Two way flow restrictor**  
with quick fit connectors  
**Ref 13025803**      **Units.1**

7



**One way restrictor**  
Non-return valve over hose  
**Ref. 13025805**      **Units.1**

8



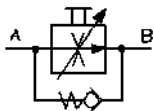
**Piloted one way restrictor**  
Cartridge valve inserted in a  
block with quick fit  
connectors  
**Ref. 13025813**      **Units.1**

9



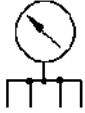
**One way flow restrictor**  
With quick fit connectors  
**Ref. 13025804**      **Units.1**

10



**Pressure compensated one  
way flow regulator**  
NG06 valve onto base plate  
with quick fit connectors  
**Ref. 16100015**      **Units.1**

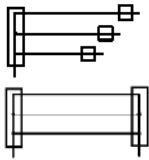
11



**4 connections distributor on manifold with pressure gauge 0...60 bar**

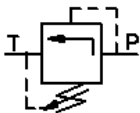
Glycerin damped, on base plate with quick fit connectors  
Ref. 13025741                      **Units.1**

12



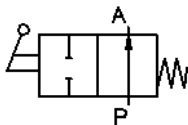
**Set of tubes for testing pressure drops** One item with 3 different diameters and the same length, another item with 3 different lengths and the same diameter  
Ref. 13025791                      **Units.1**

13



**2 pressure relief valve 2...64 bar**  
Cartridge valve inserted in a block with quick fit connectors  
Ref. 13025811                      **Units.2**

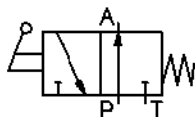
14



**2/2 manual acting valve, spring return**

NG06 valve onto base plate with quick fit connectors  
Ref. 16100016                      **Units.1**

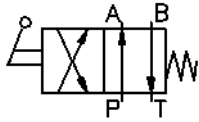
15



**3/2 manual acting valve, spring return**

NG06 valve onto base plate with quick fit connectors  
Ref. 16100017                      **Units.1**

**16**



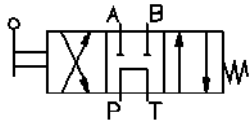
**4/2 manual acting valve,  
spring return**

NG06 valve onto base plate  
with quick fit connectors

**Ref. 16100018**

**Units.1**

**17**



**4/3 manual acting valve,  
spring centered**

P-T connected at centered  
position, NG06 valve onto  
base plate with quick fit  
connectors

**Ref. 16100019**

**Units.1**

**18**



**Workbook with theory and  
practices**

**Ref. 01506991**

**Units.1**

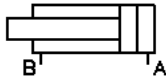
Every valve size will be NG06 – Cetop 3.

Every hydraulic connection will use anti-leakage quick-fit ecologic connectors

**Hydraulics level 2**

Ref. 53952016

**1**



**Double action cylinder**

Ø32 / Ø16 x 200 mm stroke.  
Over plate with cam and quick fit connectors

Ref. 16100023

Units.1

**2**



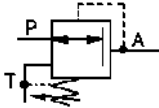
**Set of 10 hoses with quick female connectors**

8 hoses NW6 x 600 mm length  
2 hoses NW6 x 1000 mm

Ref. 13025795

Units.1

**3**



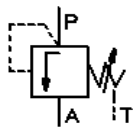
**Pressure reducing valve, 3 ways**

2...64 bar, NG06 valve onto base plate and quick fit connectors

Ref. 16100020

Units.1

**4**



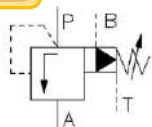
**Pressure relief valve, 3 ways, sequence valve.**

2...64 bar, NG06 valve onto base plate and quick fit connectors

Ref. 16100021

Units.1

**5**



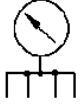
**Pilot operated relief valve**

Ventable (B), pilot operated, balanced piston relief valve, onto base plate and quick fit connectors

Ref. 16100022

Units.1

6



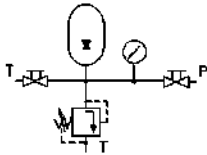
**4 connections distributor on manifold with pressure gauge 0 -60 bar**

Glycerin damped, on base plate with quick fit connectors

**Ref. 13025741**

**Units.1**

7



**Hydraulic diaphragm accumulator with T.U.V. safety certificate**

2 manual valves and a relief security valve.  $V=0,7 \text{ dm}^3$ , Nitrogen pressure 20 bar

**Ref. 13025790**

**Units.1**

8



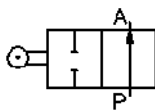
**Hydraulic motor**

Bi-directional, internal gear, with shaft wheel.  $12,5 \text{ cm}^3/\text{rev}$

**Ref.13025802**

**Units.1**

9



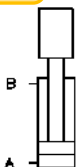
**2/2 valve, ball actuated, spring return**

With acting cam for  $\varnothing 32$  cylinder rod

**Ref. 16100024**

**Units.1**

10



**Counter-weight 17 Kg**

To be fixed on one of the trolley sides  
It includes a double effect cylinder  $\varnothing 20/\varnothing 12$ , 150 mm stroke in order to make traction/compression exercises.  
Transparent protection screen

**Ref. 13026580**

**Units.1**

Every valve size will be NG06 – Cetop 3.

Every hydraulic connection will use anti-leakage quick-fit ecologic connectors

Every component will be suitable for working on panels with  $\varnothing 17$  mm holes every 50mm (horizontally and vertically).

**Hydraulics complementary**

1



**Single action cylinder**

Ø32 / Ø16 x 160 mm stroke  
Spring return. Over plate with cam and quick fit connectors  
**Ref. 13026563**      **Units. 1**

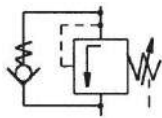
2



**Double rod cylinder.**

Ø16 x Ø32 x Ø16 mm stroke,  
with two acting cams. Over plate with quick fit connectors  
**Ref. 13025796**      **Units. 1**

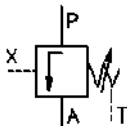
3



**Pressure relief valve, 3 ways, sequencer valve with check valve**

Direct operated, 2...64 bar,  
NG 06 valve onto base plate  
**Ref. 16100025**      **Units. 1**

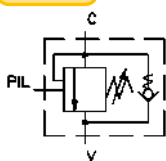
4



**Pressure relief valve, 3 ways, with external pilot**

Direct operated, 2...64 bar,  
NG06 valve onto base plate  
**Ref. 16100026**      **Units. 1**

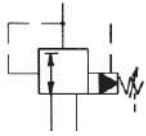
5



**Counterbalance valve**

Overcenter - Cartridge valve  
inserted in a block with quick fit connectors  
**Ref. 17431**      **Units. 1**

6



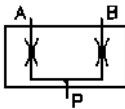
**Pressure reducing valve, prepiloted**

Pilot controlled pressure reducing valve. 2...64 bar, onto base plate

Ref. 16100031

Units. 1

7



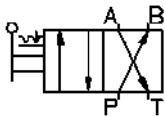
**Flow divider**

Flow divider valve, equal flows.  
Max flow=38 l/min.

Ref. 13026562

Units. 1

8



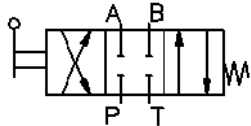
**4/2 manual acting valve, with mechanical detent**

NG06 valve onto base plate

Ref. 16100027

Units. 1

9



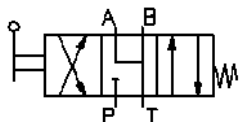
**4/3 manual acting valve, closed centers, spring centered**

A, B, P, T closed at centered position, NG06 valve onto base plate

Ref. 16100028

Units. 1

10



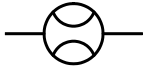
**4/3 manual acting valve, A, B, T in discharge, spring centered**

In central position A, B and T are linked. NG06 valve onto base plate

Ref. 16100029

Units. 1

11



**Optical flowmeter**

Graduated scale, range 0,5 - 9 l/min. With quick fit connectors

**Ref. 13026810**

**Units. 1**

12



**Unitary hoses, with two quick-fit self-sealing female couplings**

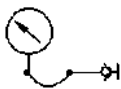
Size DN 06, different lengths

**Ref. 033587** length. 600 mm.

**Ref. 031341** length.1000 mm.

**Ref. 033586** length.1500 mm.

13



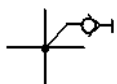
**Pressure gauge with minimess outlet**

Range 0 – 60 bar, with magnetic support and 0,5m minimess hose

**Ref. 13023477**

**Units. 1**

14



**Cross distributor with minimess**

Four quick fit connectors

and one minimess outlet

**Ref. 13025801**

**Units. 1**

15



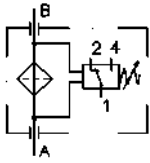
**Y distributor**

Three connections with quick fit connectors

**Ref. 13025812**

**Units. 1**

16



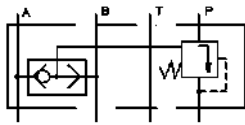
**Pressure filter**

Pressure filter with clogging indicator and connection cable. 10µ cartridge

Ref. 13025807

Units. 1

17



**Pressure balance**

Modular assembly under distribution valve NW06.

$\Delta p = 5 \text{ bar.}$

Ref. 13018774

Units. 1

18



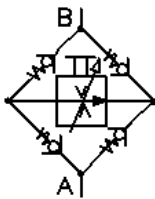
**Pressure compensated flow regulator of 3 ways**

Manual regulation,  $Q_{max} = 3,2 \text{ l/min}$ , onto base plate with quick fit connectors

Ref. 16100033

Units. 1

19



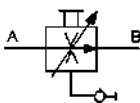
**Pressure compensated flow regulator of 2 ways over rectifier bridge**

Manual regulation,  $Q_{max} = 3,2 \text{ l/min}$ , onto base plate with bridge

Ref. 16100034

Units. 1

20



**Pressure compensated flow regulator of 2 ways with minimess outlet**

Manual regulation,  $Q_{max} = 3,2 \text{ l/min}$ , onto base plate with quick fit connectors

Ref. 16100032

Units. 1

21



**Digital flowmeter – thermometer**  
Parametrizable with keyboard and display. Output, digital output and I/O link. Flow or temp reading.

**Ref. 38872**

**Units. 1**

22



**Sensocontrol diagnostic case**

For measurement of magnitudes in a hydraulic system: Pressure  $\Delta p$ , Temperature, RPM and Flow  
Composed of a “plug and work” measurement unit with automatic sensor recognition (2 simultaneous channels) Sensors adapted with quick connectors and with reading-acquisition software of data

**Ref. 01522078**

**Units. 1**

23



**Device for control and filling of nitrogen in accumulators**

Case with pressure gauges (low/high), flexible pipe with unions, block with regulation valve, gasket kit

**Ref. 01006601**

**Units. 1**

24



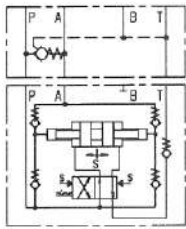
**Nitrogen bottle + Pressure reducer**

Load pressure 150 bar, volume 5 liters

**Ref. 01507509**

**Units. 1**

25



**Pressure multiplier 1:4**

Dynamic, with piloted non-return for By Pass. On plate with 3 quick couplings

**Ref. 16100030**

**Units. 1**

26



**Block with 4 cartridge valves**

It incorporates the following hydraulic functions:

- Throttle valve
- Limiting valve
- Non-return
- Piloted non-return

Block with handles, on a base plate for adaptation to a panel with zero leak quick couplings

**Ref. 13028085**

**Units. 1**

27



**2/2 cartridge valve block, control by solenoid valve 4/3**

Block with function: valve 4/3 NG10 closed centers, pilot control by 4/3 NG06 P,A and B communicated

Block with handles, on a base plate for adaptation to a panel with zero leak quick couplings

**Ref. 13028086**

**Units. 1**

All components incorporate ecological, anti-drip, self-sealing quick couplings. The components incorporate anodized aluminum base plates, with a panel fastening system with holes from Ø17 to 50x50 mm.

Do not hesitate to ask us for any other element or additional valve, more complementary elements are available with different configurations / controls to those shown in this catalogue

**Electro Hydraulics level 1**

Ref. 53952017

1



**Power supply unit.**

**110-220 VAC/24 VDC, I=5 A. Over load and short circuit protection**

On/Off switch

On/Off indication lamp

Electronically stabilized

Ø=4 mm electronic quick connectors

Plastic box with printed cover

**Ref. 23500965**

**Units.1**

2



**Control panel with timer**

4 push buttons, 2 green, 1 red, 1 yellow, with 1 normally open + 1 normally closed contacts each

1 switch with 1 normally open + 1 normally closed contacts

1 Electronic timer programmable in 8 modes, 0 to 12 s regulation. NC/NA out

4 spark suppressing diodes

4 indicator lights, 2 green, 1 red and 1 yellow

Ø=4 mm quick connectors

**Ref. 23500966**

**Units.1**

3



**Limit switch, with 1 normally closed contact + 1 normally opened contact**

Acting by retractable roller, activation direction selectable

Ø=4 mm female connectors

**Ref. 13019696**

**Units.3**

4



**Relays module**

3 relay unit with 4 switched contacts each

On/Off light indicator on every relay solenoid

Spark suppressing diode on every solenoid

6 connection divider for + voltage

6 connection divider for - voltage

∅=4 mm quick connectors

Plastic box with printed cover

**Ref. 23500968**

**Units.1**

5



**Set of connection cables**

14 blue cables, 50 mm length

14 red cables, 50 mm length

8 blue cables, 150 mm length,

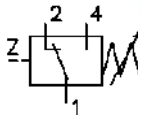
8 red cables, 150 mm length.

With ∅4 mm male quick connectors

**Ref. 23500081**

**Units.1**

6



**Adjustable pressure switch**

Max. Pressure=40bar

Output signal by exchanged (switched) contact

**Ref. 14009140**

**Units.1**

7



**Cable + connector for pressure switch**

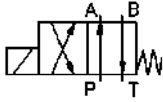
Male ∅=4 mm quick connectors

Cable length = 1,5 m

**Ref. 23500079**

**Units.1**

8



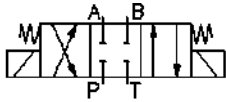
**4/2 solenoid valve, 24Vdc solenoid and spring return**

NG6 size valve, assembled on base plate with quick fit ecologic connectors

**Ref. 16100036**

**Units.1**

9



**4/3 solenoid valve, 24Vdc solenoids and spring centered**

A, B, P and T closed in centered position. NG6 size valve assembled on base plate with quick fit ecologic connectors

**Ref. 16100037**

**Units1**

10



**1 Connector for solenoid**  
Including solenoid 2P+G connector, on/off indicator lamp, cable and male  $\varnothing=4$  mm quick connectors

(3 units: 2 black and 1 white)

**Ref. 23500025**

**Units.3**

11



**Electro hydraulics workbook with theory and practice**

**Ref. 01506992**

**Units.1**

Every valve size will be NG06 – Cetop 3.


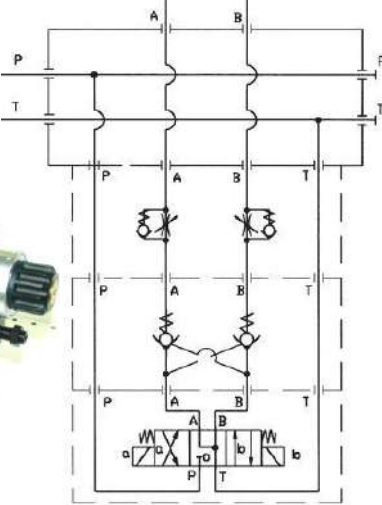
Every hydraulic connection will use anti-leakage quick-fit ecologic connectors

Every component will be suitable for working on panels with  $\varnothing 17$  mm holes every 50mm (horizontally and vertically).

The electrical components are provided with  $\varnothing 4$  mm quick-connect sockets

**Electro Hydraulics level 2 – Modular Blocks 1 – 4**

1


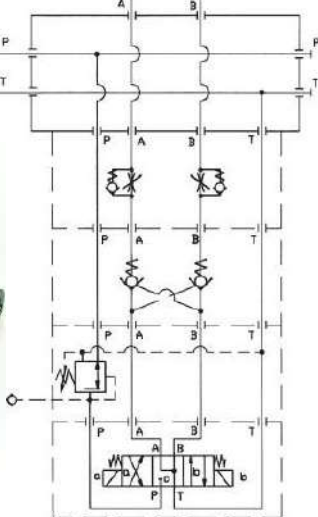
**Position & flow control**

Composed by:

- Solenoid valve 4/3 (A,B to T)
- Mod. piloted double non-return
- Double throttle module with non-return valve
- Base plate with four self-sealing quick connectors
- Two connectors with led, cable with plugs for solenoids

**Ref. 5395201** **Units. 1**

2


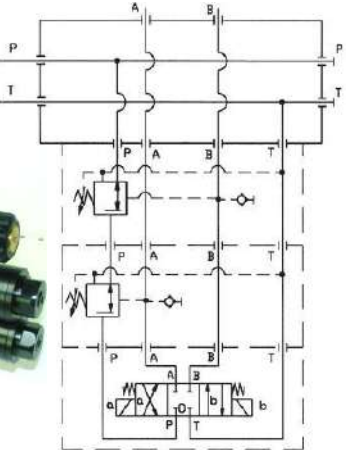
**Position, flow & pressure control**

Composed by:

- Solenoid valve 4/3 (A,B to T)
- Mod. piloted double non-return
- Double throttle module with non-return valve
- Modular pressure reducer
- Base plate with four self-sealing quick connectors
- Two connectors for solenoids

**Ref. 5395202** **Units. 1**

3

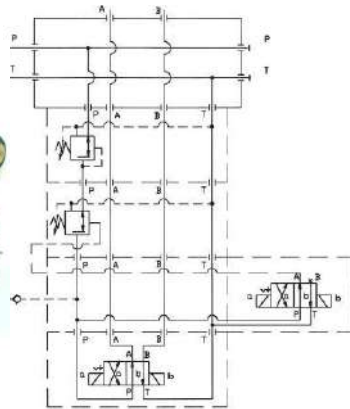
**Independent control of pressure at both working directions**

Composed by:

- Solenoid valve 4/3 (CC)
- Modular pressure reducer, controlled from A, with minimess
- Modular pressure reducer, piloted from B, with minimess
- Base plate with four self-sealing quick couplings
- Two connectors for solenoids

**Ref. 5395203** **Units. 1**

4



**Two independent pressures selection**

- Composed by:
- Two 4/2 solenoid valves with mechanical interlock
  - Modular pressure reducer
  - Modular pressure reducer, with external pilot
  - Command block, with minimess
  - Motherboard with four sockets
  - Two connectors for solenoids

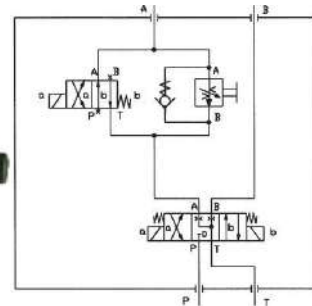
**Ref. 53952024**

**Units. 1**

**Electro Hydraulic – Other Modular Blocks 5-9**

**Single Ref.**

5



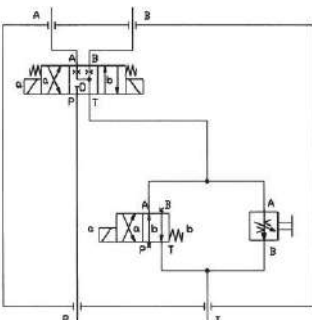
**Quick / slow speed change with secondary regulation**

- Composed by:
- Solenoid valve 4/3 (A,B to T)
  - 4/2 monostable solenoid valve
  - Compensated flow regulator with anti-return
  - Control block
  - Motherboard with four sockets
  - Three connectors for solenoids

**Ref. 53952025**

**Units. 1**

6



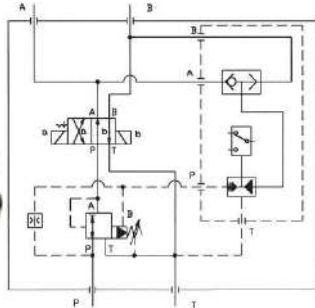
**Quick / slow speed change at both working directions**

- Composed by:
- Solenoid valve 4/3 (A,B to T)
  - 4/2 monostable solenoid valve
  - Compensated flow regulator
  - Control block
  - Motherboard with four sockets
  - Three connectors with led, cable and plugs for solenoids

**Ref. 53952026**

**Units. 1**

7



**Pressure regulation with automatic pressure control by using self-regulating pressure switch**

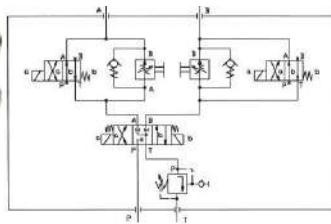
Composed by:

- 4/2 solenoid valve with mechanical interlock
- Preactuated pressure reducer
- Pressure switch with self-regulation. With connector and cable
- Base plate with four quick connectors
- Two connectors with led, cable and plugs for solenoids

**Ref. 53952027**

**Units. 1**

8



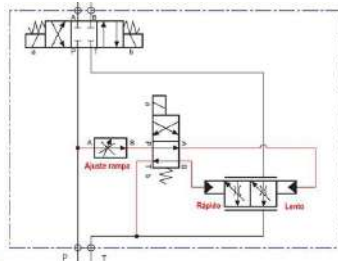
**Quick / slow speed change, independent in both working directions, with primary regulation and counter-pressure**

- 4/3 solenoid valve (A,B to T)
- Two 4/2 solenoid valve single state
- Two compensated flow regulators with anti-returns
- Modular back pressure valve
- Control block
- Motherboard with 4 sockets
- Four connectors for electromagnets

**Ref. 53952028**

**Units. 1**

9



**Pre-proportional hydraulics: Quick / slow speed change control with ramp regulation**

Valve block that allows two speeds: quick/slow, with ramp adjustment, time to pass from one speed to another.

- Base plate with four quick connectors
- Three connectors with led, cable and plugs for solenoids

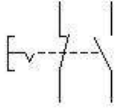
**Ref. 16100060**

**Units. 1**

Electro hydraulics complementary

Single Ref.

1

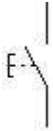


**Emergency push button**

Push button with interlocking, with 1NO contact and 1 NC contact. Ø4mm sockets

**Ref. 23500952**

2

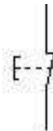


**Electric push button NO**

Push button green color (start), with 1NO contact. Ø4mm sockets

**Ref. 23500953**

3



**Electric push button NC**

Push button black color (stop), with 1NC contact. Ø4mm sockets

**Ref. 23500954**

4

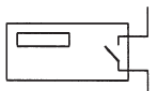


**Electric switch**

Electric switch, rotary actuation, black color (auto). Ø4mm sockets

**Ref. 23500923**

5

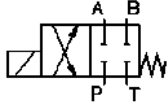


**Up/Down counter**

Electronic settings, two channels: A and B. Preselection value and reset can be manual or electric. Output: 1 switched contact, Ø4mm sockets

**Ref. 23500956**

6

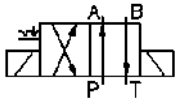


**4/2 solenoid valve, 24Vdc solenoid and spring return**

Closed centers in off state. NG6 size valve, assembled on base plate with quick fit ecologic connectors

**Ref. 16100038**

7



**4/2 solenoid valve, 24Vdc solenoids with mechanical interlocking**

NG6 size valve, assembled on base plate with quick fit ecologic connectors

**Ref. 16100039**

8

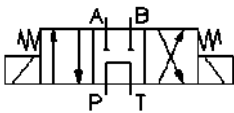


**4/3 solenoid valve, 24Vdc solenoids and spring centered**

In central position A and B to tank. NG6 size valve assembled on base plate with quick fit ecologic connectors

**Ref. 16100040**

9

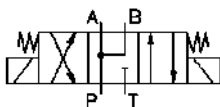


**4/3 solenoid valve, 24Vdc solenoids and spring centered**

In central position P to tank. NG6 size valve assembled on base plate with quick fit ecologic connectors

**Ref. 16100041**

10

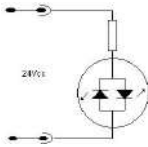


**4/3 solenoid valve, 24Vdc solenoids and spring centered**

In central position A, B and P linked. NG6 size valve assembled on base plate with quick fit ecologic connectors

**Ref. 16100053**

11



**1 connector + cable for solenoid**

solenoid's connector 2P+T, led and cable with two Ø4mm plugs

**Ref. 235000025**

12



**PLC's on rack**

Programmable logic controllers from the main manufacturers on the market. Different models and I/O configurations of Siemens, Omron..

Ask for the requirements

**Ref. PLC's on rack**

13



**Automation Studio design and simulation software**

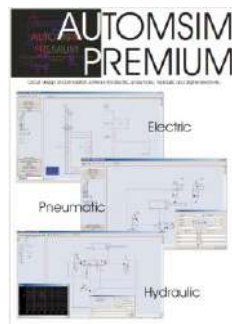
Powerful software for the design and simulation of circuits with different automation technologies.

Different packages: Pneumatics, Hydraulics, Fluid Power, Electrotechnics, Automation, Premium

Ask for the licenses

**Ref. AStudio**

14



**AUTOMSIM software**

Friendly software for drawing and simulation of electro- hydraulics, and electro pneumatics circuits. Available packages: Pneumatics, Hydraulics and Premium (Pneumatics, hydraulics and electric controls).

Ask for the licenses

**Ref. AUTOMSIM**

Proportional hydraulics level 1

Ref. 53952018

1



**Electronic control for proportional valves**

Basic electronic control for two proportional solenoids I<sub>max</sub>: 1A  
Current regulation by potentiometer and display by ammeter (one per coil). Possibility of introducing Dither signal to improve hysteresis.

Plastic box with printed transparent cover and  $\varnothing=4$  mm quick connectors

Ref. 23500970

Units. 1

2



**Set of 2 connectors with LED**

Progressive lighting of the LED according to the current intensity With cable and  $\varnothing 4$ mm plugs

Ref. 23500036

Units. 1

3



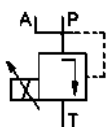
**Force measuring device.**

Proportional coil on precision electronic scale to measure the force it exerts

Ref. 13026571

Units. 1

4



**Proportional pressure relief valve**

Direct command. Pressure regulation range from 0 to 60 bar. On plate with 3 quick couplings

Ref. 16100049

Units. 1

5



**4/3 Proportional distributor valve, NG06**

Directly operated by 24Vdc(0,8A) solenoids, closed centres, spring-centring. On base plate with quick fit ecologic connectors

**Ref.16100048**

**Units.1**

6



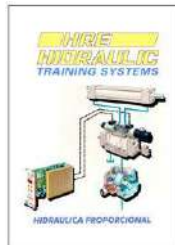
**4/3 Proportional distributor valve NG10 precontrolled.**

Indirectly operated, closed centres, spring-centring. On base plate with quick fit ecologic connectors

**Ref.16100050**

**Units.1**

7



**Workbook with theory and practices**

Proportional Hydraulics

**Ref. 01506994**

**Units.1**

Every hydraulic connection will use anti-leakage quick-fit ecologic connectors

Every component will be suitable for working on panels with Ø17 mm holes every 50mm (horizontally and vertically).

## Proportional hydraulics level 2:

Ref. 034915

### APPLICATIONS OF POSITION, SPEED AND FORCE CONTROL OF A HYDRAULIC DRIVE

A single parameterizable controller for the different practices

1



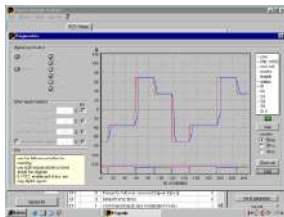
#### Closed / Open loop controller PZD-PWD

Microprocessor based electronic cards for configuration, parameterization and on-line monitoring of servo hydraulic systems. The same control is used for every exercise, internal (6) / external setpoint values (analog input: +/- 10V or 4-20mA), acceleration / deceleration ramps, PID digital controller. Assembled and totally wired to base plate with printed plate and  $\varnothing=4\text{mm}$  quick connectors

Ref. 23505019

Units.1

2



#### Pro-PxD software

It allows a comfortable parameter setting for the PZD-PWD controller. Parameters can be saved or downloaded. Online connection with plotting functions for commands and feedback

Ref. ProPXD

Units.1

3



#### Workbook with practices

Proportional hydraulics applications

Ref. 01522012

Units.1

#### Proposed exercises

**Exercise 1:** Ramp speed control of a linear actuator in open loop – Page 30

**Exercise 2:** Speed control by ramps of a linear actuator in internal closed loop – Page 30

**Exercises 3/4:** Speed control of a rotary actuator in open loop / closed loop – Page 31

**Exercise 5:** Position control of a linear actuator in closed loop – Page 31

**Exercise 6:** Angular position control of rotary actuator in closed loop – Pages 31 (loose element) and 32

**Exercises 7/8:** Different working pressures: Closed / open loop pressure control – Page 32

4



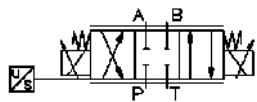
**Double rod cylinder.**

Ø16 x Ø32 x Ø16 mm stroke, with two acting cam. Over plate with quick fit connectors

**Ref. 13025796**

**Units. 1**

5



**4/3 propotional valve with LVDT.**

Directly operated by solenoids and spring centered, closed centres, with position sensor (LVDT). NG06 valve on base plate with quick fit ecologic connectors

**Ref.16100047**

**Units. 1**

6



**Limit switch, with 1 NC + 1 NO contact**

Acting by retractable roller, activation direction selectable  
Ø=4 mm female connectors

**Ref. 13019696**

**Units.1**

7



**Relay module**

3 relay unit with 4 exchanged (switched) contacts each On/Off light indicator on every relay solenoid

Spark suppressing diode on every solenoid

6 connection divider for 24Vdc

6 connection divider for 0Vdc

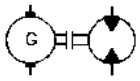
Ø=4 mm quick connectors

Plastic box with printed cover

**Ref. 23500968**

**Units.1**

8



**Hydraulic motor with speed transducer**

Dynamometric sensor assembled to hydraulic motor, analog output 0 -/+ 10Vdc On base plate with quick fit ecologic connectors

**Ref. 30097**

**Units.1**

9



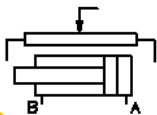
**Rotary position sensor (loose).**

Includes mechanical couplings to attach to the motor shaft of the equipment level 2 (motor's Ref 13025802)

**Ref. 23500994**

**Units.1**

10



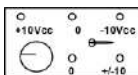
**Cylinder with position transducer**

Double effect, Ø32 x Ø22 stroke 200mm. Assembled onto base plate with quick fit ecologic connectors

**Ref. 20734**

**Units.1**

11



**External set-point value generator**

Output 0 +/- 10 Vdc with rotating joystick. In plastic box with Ø=4mm plugs and signal switch selection

**Ref. 21503701**

**Units.1**

12



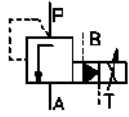
**Digital pressure transducer**

With display, pressure range: 0-60 bar, parameterization functions and pressure settings, 2 digital outputs and 1 analog output 0...20mA / 4...20mA On base plate with quick connectors

**Ref.13026568**

**Units.1**

**13**



**Proportional pressure relief valve**

Pilot operated relief valve with proportional adjustment: 4-64bar  
Nominal flow=40 l/min. NG06 valve on base plate with quick connectors

**Ref. 16100046**

**Units.1**

Every valve size will be NG06 – Cetop 3.

Every hydraulic connection will use anti-leakage quick-fit ecologic connectors

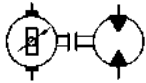
Every component will be suitable for working on panels with Ø17 mm holes every 50mm (horizontally and vertically).

The electrical components are provided with Ø4 mm quick-connect sockets

**Proportional hydraulics accessories / complements**

**Single Ref.**

**1**



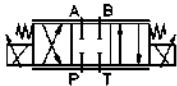
**Hydraulic motor with position**

**transducer** Rotary potentiometer sensor assembled to hydraulic motor, analog output 0...10Vdc. On base plate with quick fit ecologic connectors

**Ref. 38848**

**Units.1**

**2**



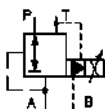
**4/3 Proportional distributor valve,NG06**

Directly operated by 9Vdc(2,7A) solenoids and spring centered, closed centres, on base plate with quick fit ecologic connectors

**Ref.16100051**

**Units.1**

**3**



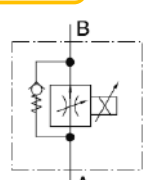
**Proportional pressure reductor valve**


Pilot operated reductor valve with proportional adjustment: 4-64bar  
Nominal flow=40 l/min. NG06 valve on base plate with quick connectors

**Ref. 16100045**

**Units.1**

**4**





**Proportional flow control valve**  
 With pressure compensation and check valve. Nominal flow = 3,2 l/min, NG06. On base plate with quick connectors  
**Ref. 16100043** **Units.1**

**5**





**Position sensor (loose).**  
 Potentiometer over plate base, with assembly kit for cylinder level 1 (Ref. 13025799)  
 With connector, cable and Ø=4mm plugs  
**Ref. 23500995** **Units.1**

**6**





**Speed transducer (loose).**  
 Includes mechanical couplings to attach to the motor shaft of the equipment level 2 (motor's Ref 13025802)  
**Ref. 23500996** **Units.1**

Every valve size will be NG06 – Cetop 3.

Every hydraulic connection will use anti-leakage quick-fit ecologic connectors

Every component will be suitable for working on panels with Ø17 mm holes every 50mm (horizontally and vertically).

The electrical components are provided with Ø4 mm quick-connect sockets

**Proportional hydraulics level 3:**

**Ref. 42093**

**PID CONTROLLER WORKING WITH DFplus SERVOVALVE**

High dynamic proportional valve (like servo valve) DFplus with on board electronics and PID controller for applications of force, speed and position control similar to the proportional hydraulics level 2 (the actuators and the sensors of level 2 are required, only changes the DFplus valve and the PID controller)

**1**



**DFplus servo valve**

NG06 proportional valve with on board electronics and integrated VLDT for internal position closed loop. Zerolap, high dynamics - 3 dB /350 Hz at +/-5% input signal

**Possibility of work in manual by analog signal (+/-10 Vcc) or in automatic mode with PID controller or MP100 numerical control** (see page 36, hydraulics level 4) Connector, cable and Ø=4mm plugs, on base plate with quick fit connectors  
**Ref.42018** **Units.1**

**2**



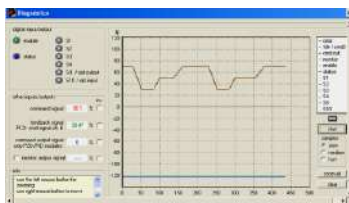
**Digital PID controller**

Axis controller for position, pressure and speed in closed loop systems **working with proportional valves with on board electronics**, Parametering by serial interface RS232c and software Pro-PXD Analog setpoint values (+/- 10V or 4-20mA), acceleration / deceleration ramps, extended PID controls. Assembled and totally wired to base plate with printed plate and Ø=4mm quick connectors

**Ref 41998**

**Units.1**

**3**



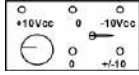
**ProPxD software**

It allows a comfortable parameter setting for the PID controller. Parameters can be saved or downloaded. Online connection with plotting functions for commands and feedbacks

**Ref. ProPXD**

**Units.1**

4



**External set-point value generator**

Permits directly introduce commands to PID controller

Output 0 +/- 10 Vdc with rotating joystick. In plastic box with Ø=4mm plugs and signal switch selection

**Ref. 21503701**

**Units.1**

5

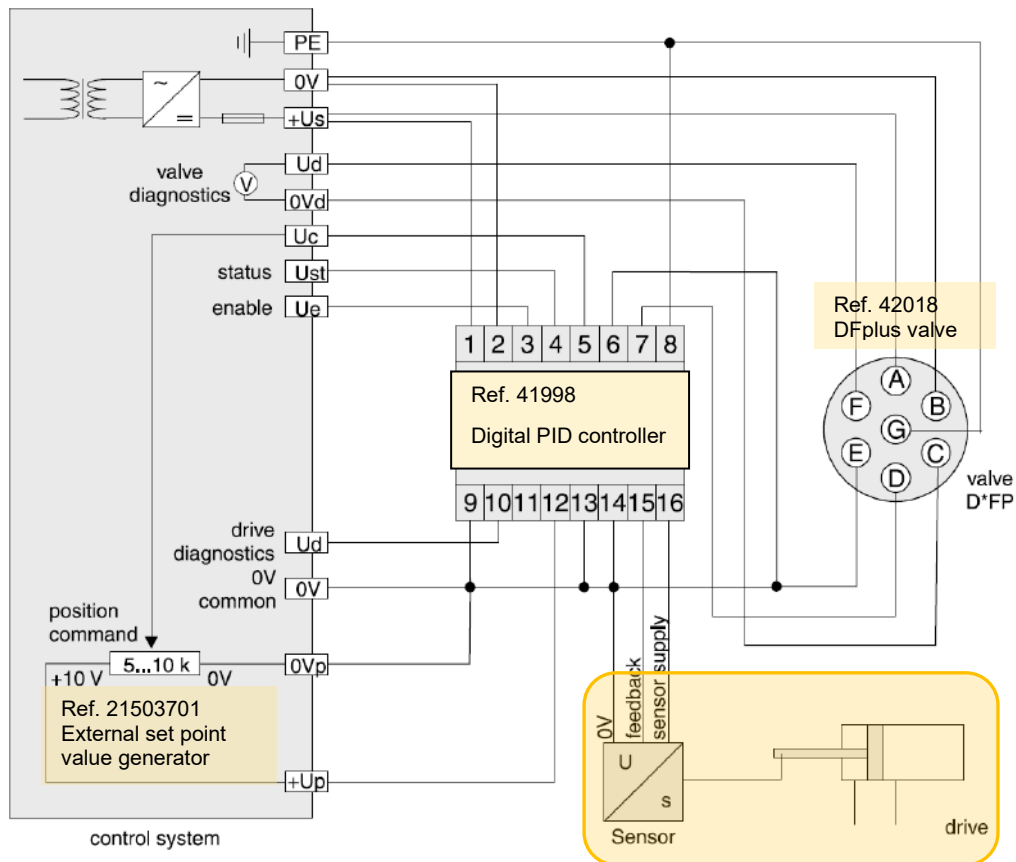


**Workbook with practices**

Proportional hydraulics applications Vol2, with PID controller and DFplus valve

**Ref. 42016**

**Units.1**



To work with the proportional hydraulics level 3 equipment, an actuator and sensor are required, available in the proportional hydraulics level 2 equipment.  
(it will depend of the control: position, speed or pressure that you want to perform)

**Proportional hydraulics level 4:**

**Ref. 42094**

**NUMERICAL CONTROL APPLICATION FOR HYDRAULIC AXIS**

Hydraulic axis controlled by MP100 numerical control with high precision

**1**



**MP100 numerical control**

High precision hydraulic axis control application

- 15 x 15 program positions, setting of speeds and time delays for the positions
- External selection of the program position
- Alfa numerical indication
- Absolute or incremental measurements

Assembled and totally wired to base plate with printed plate and  $\varnothing=4\text{mm}$  quick connectors

**Works** in combination with "PZD-PWD controller + Proportional Valve" or with "DFplus valve"

**Ref. 23505011**

**Units.1**

**2**



**Control module for MP100**

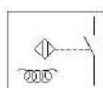
Push buttons, indicator lamps, switches for the program number selection, selector for automatic/manual cycle... available all the connection functions of the MP100 numerical control.

In plastic box printed with  $\varnothing=4\text{mm}$  plugs

**Ref. 23500999**

**Units.1**

**3**



**Inductive sensor, home reference**

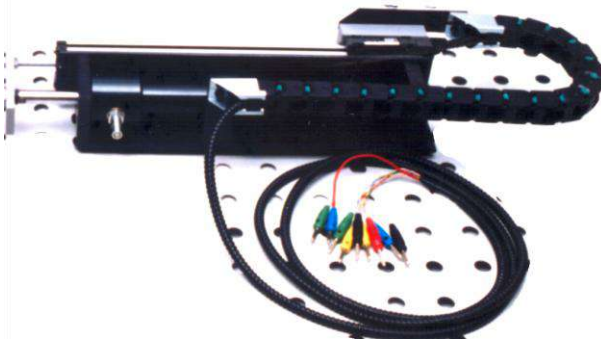
M12 proximity sensor, nominal sensing = 2mm, for searching of the home position "zero machine"

Over plate with  $\varnothing=4\text{mm}$  plugs

**Ref. 13024805**

**Units.1**

4

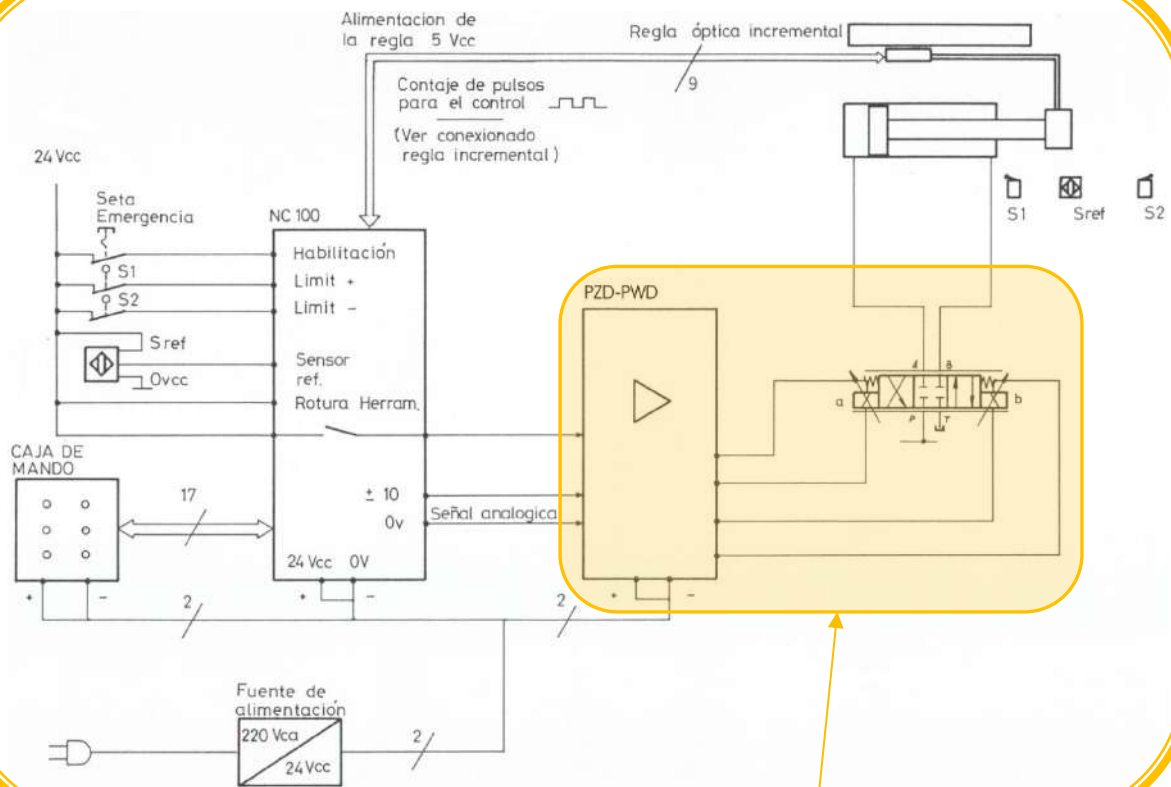


**Cylinder with encoder**

Set consisting of a Ø32Ø16 x 300mm steel cylinder, a 300mm linear guide with a ball slide, a 6-channel optical ruler with an articulated plastic cable holder and a Ø4mm connection plugs. On base plate with extra panel fixing system and 2 self-sealing quick connection plugs

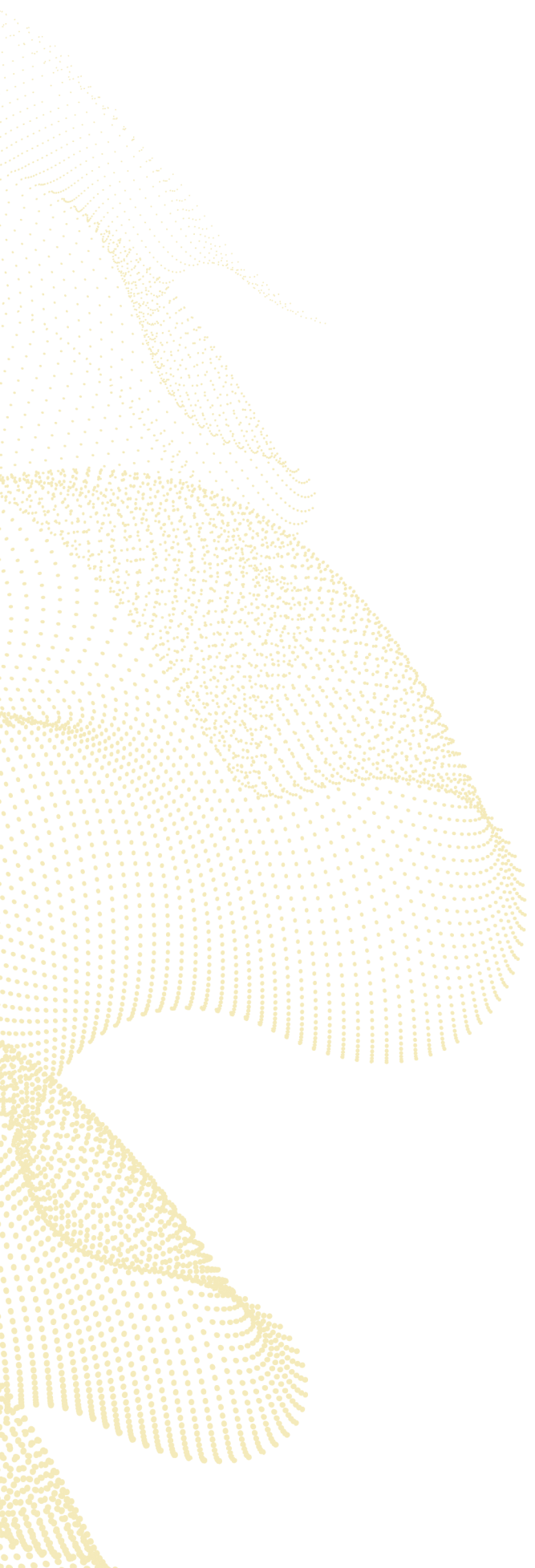
**Ref. 13026957**

**Units.1**



To work with the proportional hydraulics level 4, a set of **“PZD-PWD controller + proportional valve”** or **“Dfplus valve”** is required (see page 34)

The electrical components are provided with Ø4 mm quick-connect sockets



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