

# abco

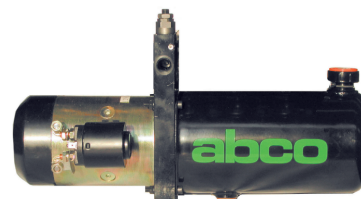
COMPONENTS FOR HYDRAULICS



MINI POWER PACKS

### MINI POWER PACKS type **SCLA** Drawing 10 DC ELECTRIC MOTOR

- Mini hydraulic power packs with weight and overall dimensions really limited. Suitable for small power installations, when is required lightness, compact dimensions, easy assembly and high reliability.
- Operating pressure up to 200bar
- DC electric motor: 1,6kW or 2,2kW
- Designed for direct assembly of the new compact stackable valves AMF/HDF\* (tables AD-220 to AD-270)



RESERVOIR	
02	2,5 L
05	5 l
08	8 l

GEAR PUMP	
11	1,1 cm <sup>3</sup> /rev
16	1,6 cm <sup>3</sup> /rev
27	2,7 cm <sup>3</sup> /rev
42	4,2 cm <sup>3</sup> /rev
58	5,8 cm <sup>3</sup> /rev

ORDERING CODE	
<b>SCLA-02-S-11-1216 / 10</b>	
<b>SCLA</b>	Series
<b>02</b>	Reservoir (see table)
<b>S</b>	Valve ports on main body: S = only on motor side D = on both sides (on request, available only with 02 reservoir)
<b>11</b>	Gear pump (see table)
<b>1216</b>	DC motor: 1216 = 12V DC – 1,6kW 2422 = 24V DC – 2,2kW
<b>10</b>	Drawing

HYDRAULIC SCHEME, PARTS LIST and DIMENSIONS			
1	Gear pump	6	Hand pump + starting block (options, see next page)
2	Main body	7	Reservoir
3	DC electric motor, with starter	8	Filler cap with breather (1/2")
4	Strainer (60 micron)	9	Drain plug (1/2")
5	Pressure relief valve	10	Foot mounting (on request, code PSC)

SCLA (basic execution)

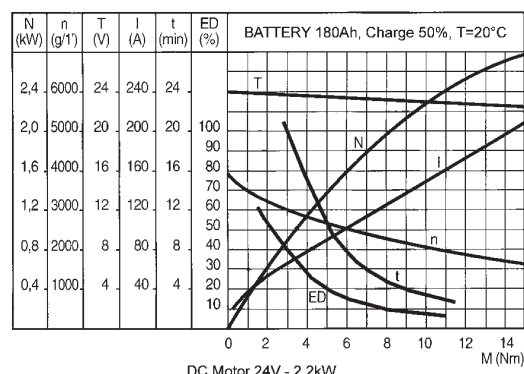
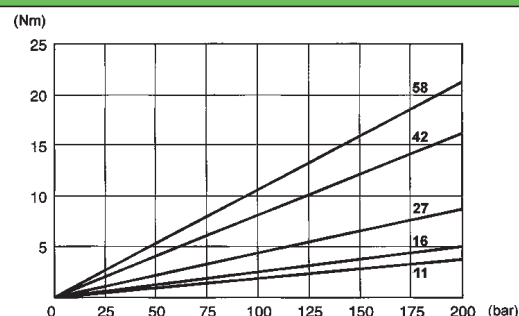
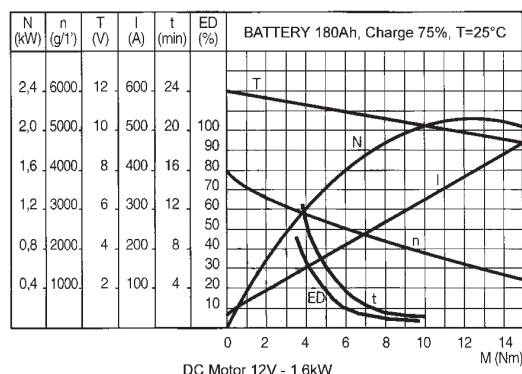
AMF / HDF interface

Reservoir	D	L
02	128	235
05	174	295
08	190	285

Subject to technical and dimensional changes without notice

### DIMENSIONING DIAGRAMS

- Find in the diagram on the right the torque (Nm) needed to pump shaft at the required pressure
- According to the required torque, for each motor type, in below report diagrams is possible to find power N (kW), rotational speed n (rpm), voltage T (V), current I (A), maximum operating full load time t (min), duty cycle ED (%).

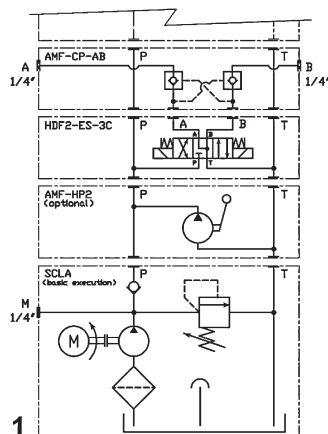


Required torque (Nm) for pump acting, depending on needed pressure (bar)

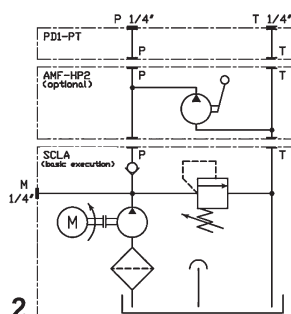
### STARTING BLOCK OPTIONS



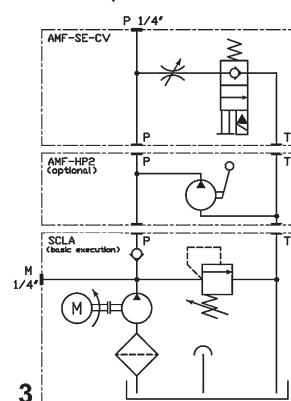
Direct assembly of HDF\* electrovalves and AMF modules (see tab. AD-220 to AD-270)



PD1-PT starting plate with P-T 1/4\"/>



AMF-SE starting plate for simple acting of cylinders (see below all the variants available)






On request, before each block or valves, can be included the stackable hand pump AMF-HP2 with 2cm<sup>3</sup>/stroke (see table AA-400)



AMF-SE starting plates for simple acting of cylinders:

Each variant includes one solenoid operated valve type EVC.34.04 (see tab. AC-100)

#### Different flow regulator variants for AMF-SE modules

AMF-SE-CV.**	1  2	Throttle adjustable
AMF-SE-Q1.**	1  2	Fixed flow 1 l/min, pressure compensated
AMF-SE-Q2.**		Fixed flow 2 l/min, pressure compensated
AMF-SE-Q4.**		Fixed flow 4 l/min, pressure compensated
AMF-SE-QV.**	1  2	Throttle adjustable, pressure compensated

\*\* solenoid valve voltage: 12=12V DC, 24=24V DC

### HDF(\*)/AMF STACKABLE VALVES SYSTEM

#### ■ Generalities

- **HDF(\*) system** is designed to create very compact hydraulic control groups, by the use of stackable solenoid valves (and modules), that don't need the use of a base plate.  
All connections A and B to "users" are 1/4" BSP and they are located directly on the solenoid valves bodies or on the pilot operated check valves.
- The HDF(\*) system is optimized to control flows up to 20 l/min with max pressure of 250 bar.
- Ideal use of HDF(\*) system is on standard minipowerpacks type **SCLA** (see table AS-101).
  - The basic system uses **HDF-ES-\*\*** solenoid valves, packed in a very compact overall dimensions, where the 4-way solenoid valve share common P and T lines (in parallel or in series connection) and A and B ports are located on the top of each 4-way valve.
  - The more sophisticated systems uses **HDF2-ES-\*\*** solenoid valves, where connections to A and B lines are internal and therefore it is possible to stack modules that control flow or pressure on individual A and/or B ports : typically the use of p.o. check valve is current.
- Elements from HDF and HDF2 systems can be mixed and can be stacked together, then giving an optimum of flexibility
- Installation normally is made by fastening, by 3 tie rods, the stack of HDF(\*) valves on a plate or manifold or block where a surface presents suitably located P and T connections.  
This principle permits the best installation of HDF(\*) stacks on minipowerpacks SCLA, on control blocks or, as a piggy back, on banks of larger 4-way control valves.
- In current application of HDF system, a "closing" plate is needed to seal the P and T lines that are passing through the stack of valves.  
In case of repetitive or large scale application, the use of "blind" final elements could be of great help:
  - solenoid valves type **HDFC-ES-\*\*** (P and T ports on face with seals)
  - solenoid valves type **HDFB-ES-\*\*** (P and T ports on face without seals)
  - p.o. check valves type **AMFC-CP-AB**
 These eliminate the need of a "closing" plate and permit shorter tie rods



#### ■ Components for the HDF system

##### 4-way solenoid valves (see table AD-220)

- Valves type **HDF-ES-\*\***, see table AD-220. Those are the basic elements with A and B ports (1/4" BSP) on top of valve; P and T passing through.



- **F2-ES-\*\***, see table AD-230. Those valves have P and T passing through and internal connection for A and B line. Normally the A and B 1/4" BSP ports must be plugged and a suitable control module is associated to the valve.
- In the basic versions the spool can be manually shifted by acting on the emergency pins. This manual override can be replaced by lockable override nut device type **G01-E**

##### Control modules

- Pilot operated check valve type **AMF-CP-AB** (see table AD-250)  
Associated to HDF2-ES-\*\*\* solenoid valve, operates on A and B lines and presents A and B ports connections 1/4" BSP on sides.



##### Relief valves

- **AMF-MOP/\*-CC**; (see table AM-F60)



Relief valve acting on main (common) P line (passing) with discharge on (common) T line (passing) **AMF-MOP/\*-P1**; **AMF-MOP/\*-T1**. Options: Version P1 presents an auxiliary 1/4" BSP port P on one side. In the same way Version T1 presents an auxiliary 1/4" BSP port T on one side.



- Relief combined with variable flow control valve type **AMF-MOP/\*-CF**

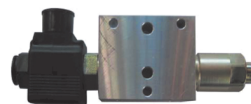
This valve presents, in parallel with the relief valve, a regulated bleeding flow from P line to T line. Version with graduated knob for the throttle valve is available (**AMF-MOP/\*-CV**).

- Relief combined with pressure compensated flow control valve type **AMF-MOP/\*-Q\*** (see table AM-F60)

This valve presents, in parallel with the relief valve, a pressure compensated bleeding flow from P line to T line. Bleeding flow rate can be fixed (**AMF-MOP/\*-Q(\*)**) or adjustable (**AMF-MOP/\*-QV**).

- Relief combined with electric by-pass valve type **AMF-MOP/\*-EV2\*** (see table AD-270)

This valve presents, in parallel with a pressure relief valve, a directional valve that allows connection of P and T lines with electric command. Normally open (**AMF-MOP/\*-EV20**) and normally closed (**AMF-MOP/\*-EV2C**) versions are available.



- A and B pressure relief valve type **AMF-MO-BA** (see table AD-265).

Relief valve acting on A and B line with discharge on (common) T line. P line is passing.

### Plates

- Inlet/outlet modules type **AMF-SE-\*** (see table AS-101).

This is a plate with standard HDF-ES interface (inlet) on one face and additional P and T ports (1/4" BSP) on one side. This plate is equipped with a NC 2/2 solenoid valve that discharge P line on T line (**AMF-SE-CO**);. This function is typical for simple acting cylinders.

In series with the NC 2/2 solenoid valve is possible to use a flow control valve that can be : throttle adjustable (**AMF-SE-CV**); fixed flow, pressure compensated (**AMF-SE-Q(\*)**); adjustable flow pressure compensated (**AMF-SE-QV**)

- Inlet/outlet module type **PD1-PT** (see table AS-101).

This plate presents HDF-ES interface (inlet) on one face and P and T ports (1/4" BSP) on one side.

- Inlet/outlet module type **PD1-03/32-5** (see table AD-220).

This plate presents HDF-ES interface (outlet) on one face and P and T ports (1/4" BSP) on the other face.

- Intermediate plate type **AMF-PM-TP**. This module permits change of circuit from "parallel" to "series" (T1 → P2).

- Steel closing plate type **PD1-03/32-0** (see table AD-220).

- Closing plate is not necessary when HDFC-ES-\*\*\* or AMFC-ES-\*\*\* are used.



### In line valves and accessories

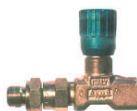
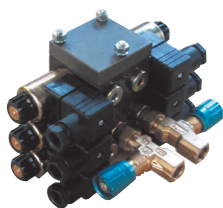
- In line throttle and check valve type **HFC-14** (see table AF-114).

This valve can be screwed directly on the A and B exit ports of the HDF-ES-\*\*\* valves, obtaining free direct flow and restricted reverse flow (adjustable).

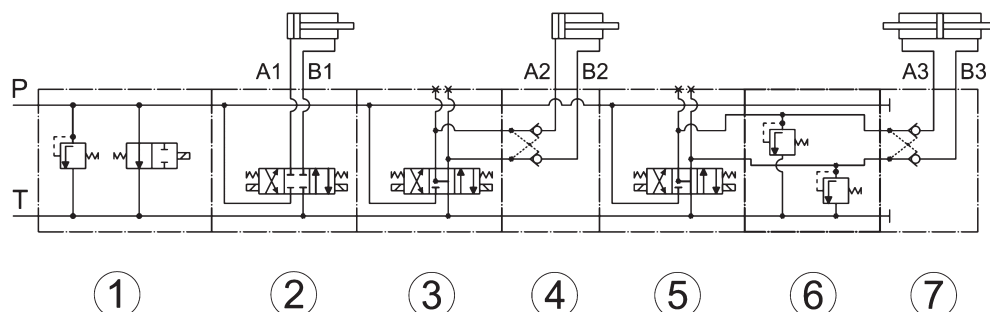
The presence of a "turning connector" allows the contemporary mounting of two valves on both ports of the solenoid valve.

- If a fixed throttle on P or T lines is needed is possible to use the "section reducers" type 3S-\*\*, that can be installed on the interested port under the seal.

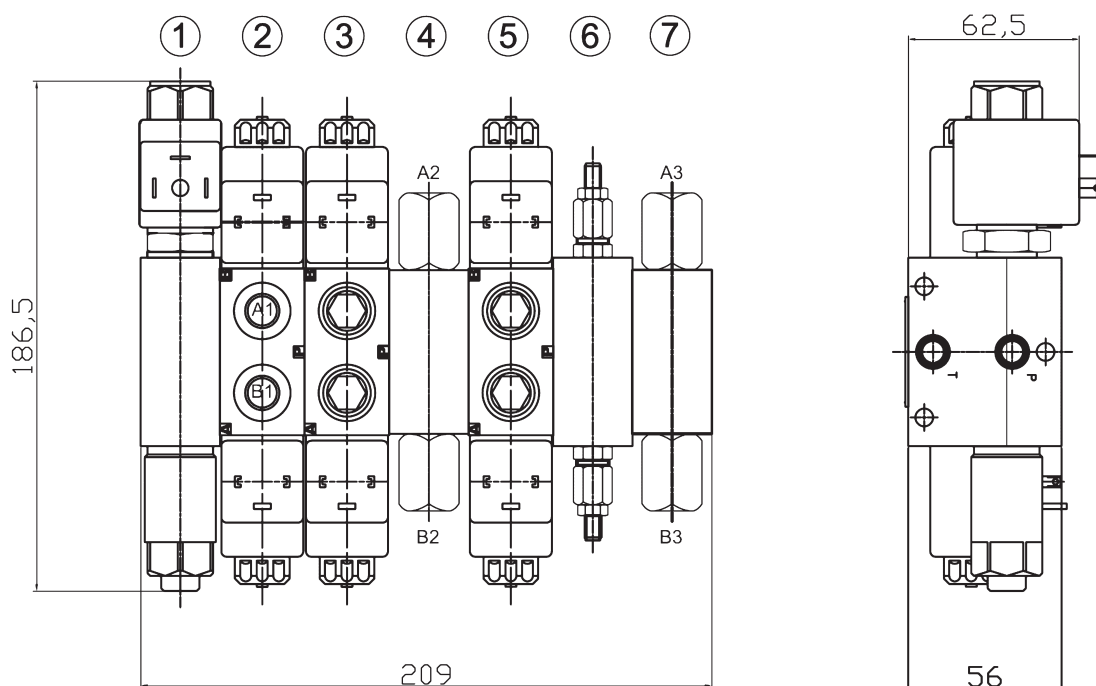
- A standard mounting kit angulare **MAF-KIT-2**, in case of HDF\*/AMF standing alone block (not connected to power pack SCLA), helps to connect the valves block by screws to the chassis of machine or to the tank of power unit.



- The use of HDF system permits to obtain hydraulic circuits in very low dimensions. The following scheme can be taken as an example :



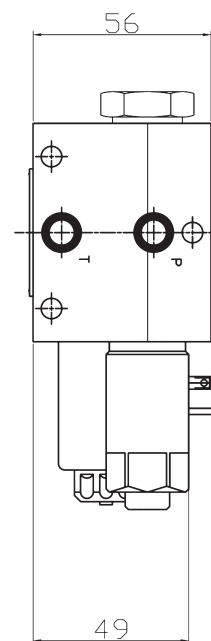
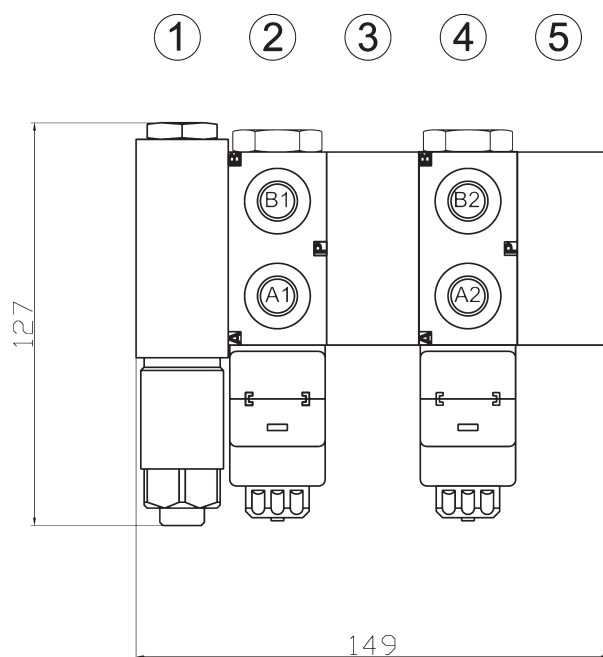
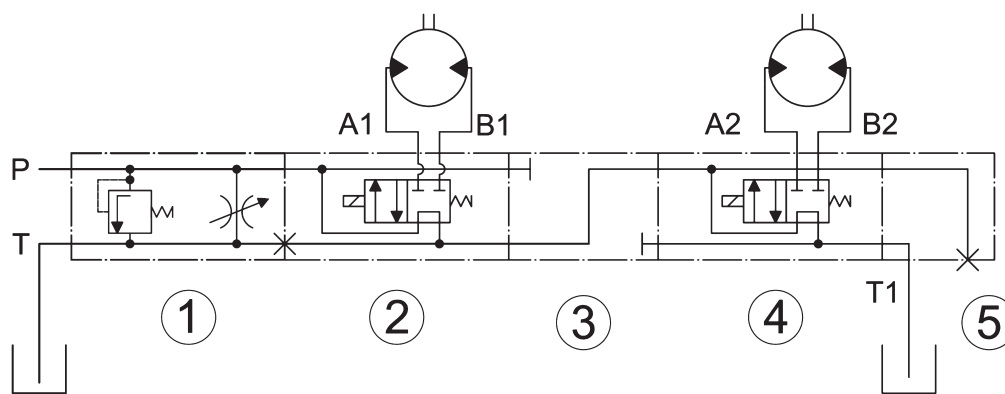
- With HDF(\*) stackable system is possible to realize this circuit using seven elements :



1	By-pass valve in parallel with a relief valve (AMF-MOP/*-EV20)	5	4-way solenoid operated valve with internal A and B ports (HDF2-ES-3C-****)
2	4-way solenoid operated valve (HDF-ES-1C-****)	6	Relief valve operating on A and B lines separately (AMF-MO-BA)
3	4-way solenoid operated valve with internal A and B ports (HDF2-ES-3C-****)	7	Double p.o. check valve, blind version(AMFC-CP-AB)
4	Double p.o. check valve (AMF-CP-AB)		

- The use of AMF-PM-TP module permits to realize, shifting the flow from P to T line, a tandem circuit in very simple way. This leads to a small size of the block. This solution implies the need for an additional T port, which is available, for example, in the closing element PD1-PT.

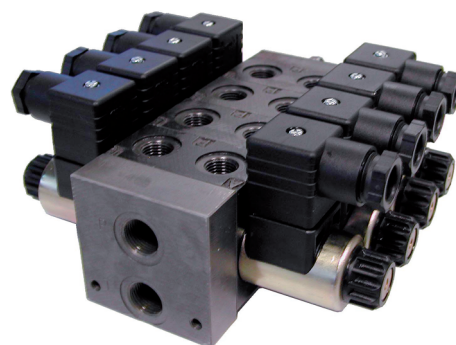
An example of a circuit with series connection of two hydraulic motors is shown in the following figures :



1	Pressure relief valve in parallel with a variable bleeding flow (AMF-MOP/*-CF)
2	4- way solenoid operated valve (HDF-ES-4ML-****)
3	Intermediate plate for tandem circuit (AMF-PM-TP)
4	4-way solenoid operated valve (HDF-ES-4ML-****)
5	Closing plate with additional G1/4 P(plugged) and T port (PD1-PT )

### HYDRAULIC STACKABLE VALVES type **HDF-ES** DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- **Standard stackable feature up to 8 bodies**
- 31 mm body thickness for a really compact assembly
- Oil immersed solenoids for AC and DC current
- 100% duty cycle
- Manual override
- Maximum operating pressure (port P-A-B): 250 bar
- Maximum operating pressure (port T): 210 bar
- Maximum flow rate: 20 l/min
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.



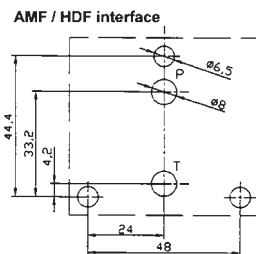
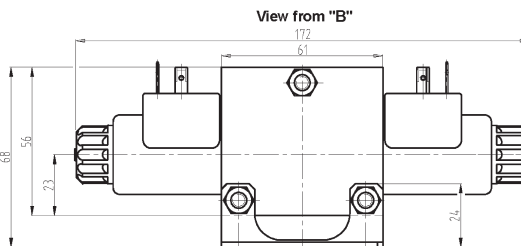
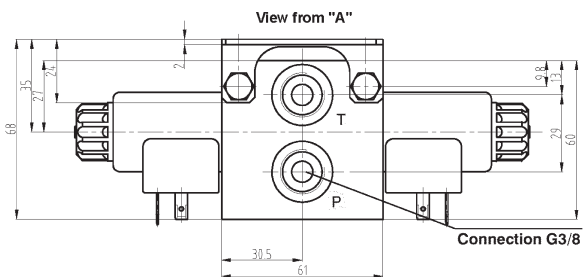
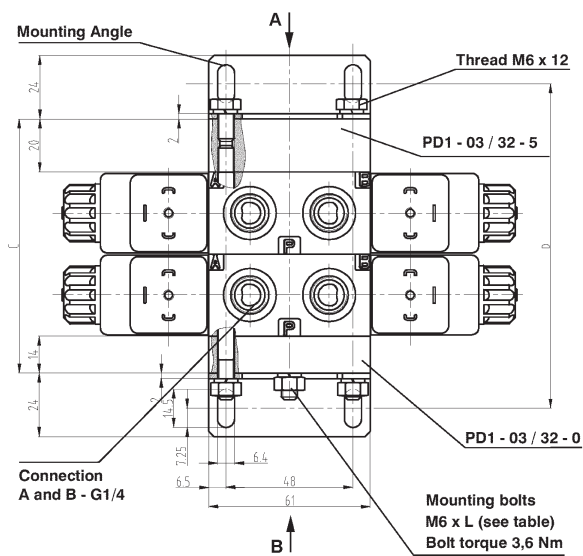
SPOOL TYPE **	
0	
1	
3	
4	

DRIVE ARRANGEMENT	
C	
N	
LL	
ML	

ORDERING CODE	
<b>HDF - ES - 1 C - * - 024C/10</b>	
<b>HDF</b>	4-way directional control valve
<b>ES</b>	Electrically controlled
<b>1</b>	Spool type (see table)
<b>C</b>	Drive arrangement (see table)
<b>*</b>	b: only for versions LL, ML, LM solenoid "b"
<b>024C</b>	= Coil voltage = (admissible variation: $\pm 10\%$ ) 0000: No coils 012C: 12V DC - 2,8A 024C: 24V DC - 1,4A 110R: rectified 115V AC - 50/60Hz 0,35A 220R: rectified 230V AC - 50/60Hz 0,17A
<b>10</b>	Drawing number
<b>PD1-03/32-5</b>	Inlet closing plate (steel)
<b>PD1-03/32-0</b>	End closing plate (steel)
<b>MAF-KIT-2</b>	Mounting angle kits

TYPICAL DIAGRAMS	
<p>Typical <math>\Delta p</math>-Q curves for valves <b>HDF-ES</b> in standard configuration, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T</p> <p>1) All spools P→A,B and A,B→T. Spool 4 P→T. 2) Spool 4 P→A,B</p>	<p>Typical <b>p</b>-Q curves of operating limits for maximum hydraulic power transferred by valves <b>HDF-ES</b></p> <p>0) Spool type 0 1) Spool type 1 3) Spool type 3 4) Spool type 4</p>

## BLOCK ASSEMBLY



**Valve mass:** 0,95 kg (with 1 coil)

1,05 kg (with 2 coils)

**Closing plates mass (Inlet+End): 1 kg (bolts not included)**

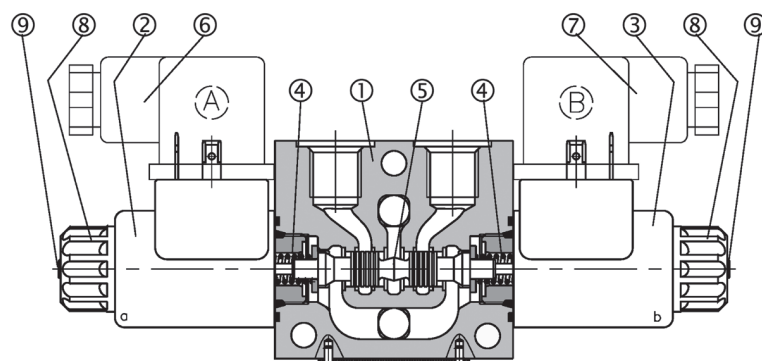
## DIMENSIONS

Number of sections	1	2	3	4	5	6	7	8
Dimension C [mm]	65	96	127	158	189	220	251	282
Dimension D [mm]	91,5	122,5	153,5	184,5	215,5	264,5	277,5	308,5
Bolts length L [mm]	55	100	133	163	194	224	256	287

Subject to technical and dimensional changes without notice

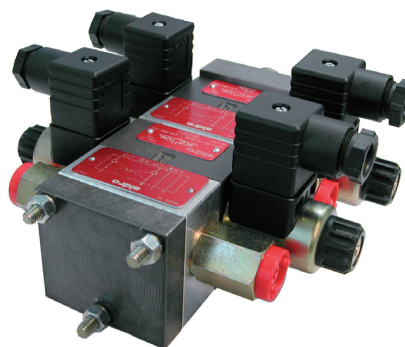
## TYPICAL SECTION

1	Body	6-7	Electrical connector
2-3	Solenoid	8	Retaining nut
4	Spring	9	Emergency pin
5	Spool		



### HYDRAULIC STACKABLE VALVES type **HDF2-ES** DIRECTIONAL CONTROL - SOLENOID OPERATED

- 4-way solenoid operated directional valves
- 31 mm body thickness for a really compact assembly
- Special execution **designed for assembly with double check valve AMF-CP-AB** (29 mm thick — Tab. AD-250)
- A, B ports on side position
- Oil immersed solenoids for AC and DC current
- 100% duty cycle
- Manual override
- Maximum operating pressure (port P-A-B): 250 bar
- Maximum operating pressure (port T): 210 bar
- Maximum flow rate: 20 l/min
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.



SPOOL TYPE **	
0	
1	
3	
4	

DRIVE ARRANGEMENT	
C	
N	
LL	
ML	

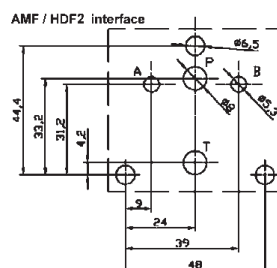
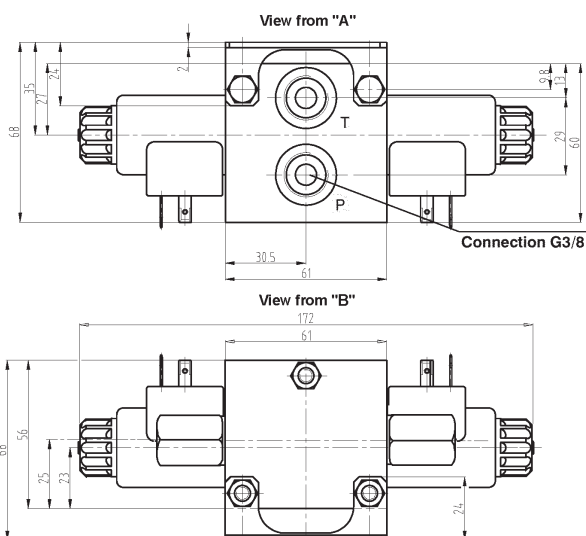
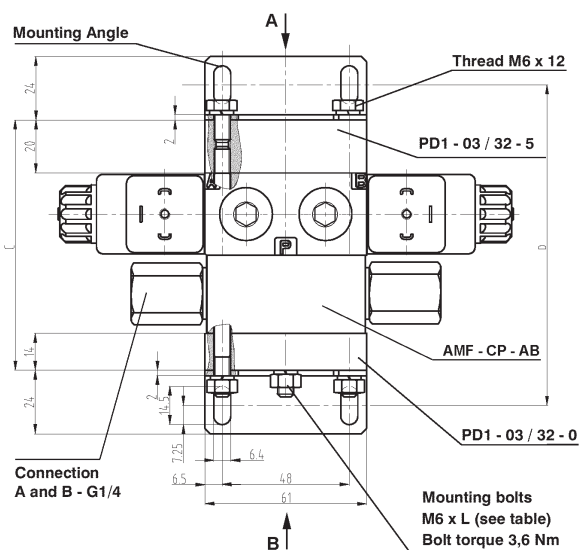
ORDERING CODE	
<b>HDF2 — ES — 3 C — * — 012C/10</b>	
<b>HDF2</b>	4-way directional control valve
<b>ES</b>	Electrically controlled
<b>3</b>	Spool type (see table)
<b>C</b>	Drive arrangement (see table)
<b>*</b>	b: only for versions LL, ML, LM solenoid "b"
<b>012C</b>	= Coil voltage = (admissible variation: ±10%) 0000: No coils 012C: 12V DC — 2,8A 024C: 24V DC — 1,4A 110R: rectified 115V AC — 50/60Hz 0,35A 220R: rectified 230V AC — 50/60Hz 0,17A
<b>10</b>	Drawing number
<b>PD1-03/32-5</b>	Inlet closing plate (steel)
<b>PD1-03/32-0</b>	End closing plate (steel)
<b>MAF-KIT-2</b>	Mounting angle kits

<b>AMF-CP-AB</b>		Double check valve (A,B) pilot operated
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TYPICAL DIAGRAMS	
<p>Typical <math>\Delta p-Q</math> curves for valves <b>HDF2-ES + AMF-CP-AB</b>, with mineral oil at 36cSt and 50°C for flow P→A,B A,B→T and P→T</p> <p>1) All spools P→A,B and A,B→T. Spool 4 P→T. 2) Spool 4 P→A,B</p>	<p>Typical <math>p-Q</math> curves of operating limits for maximum hydraulic power transferred by valves <b>HDF2-ES</b></p> <p>0) Spool type 0 1) Spool type 1 3) Spool type 3 4) Spool type 4</p>



## BLOCK ASSEMBLY



**Module(\*) mass:** 1,35 kg (electrovalve with 1 coil)

1,45 kg (electrovalve with 2 coils)

**Closing plates mass (Inlet + End): 1 kg (bolts not included)**

(\*) 1 module = HDF2-ES-\*\* + AMF-CP-AB

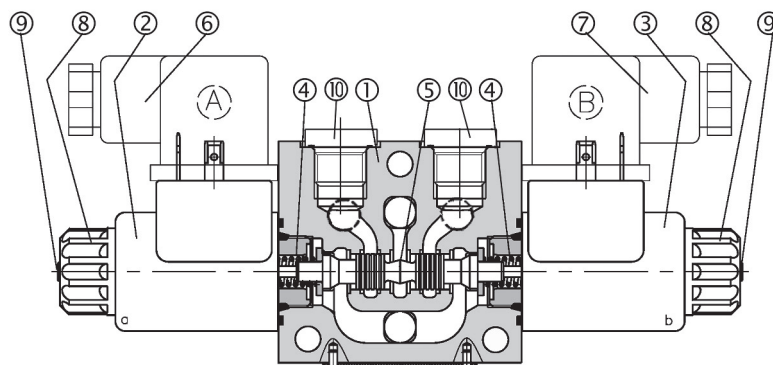
## DIMENSIONS

Number of sections	1	2	3	4	5	6
Dimension C [mm]	94	154	214	274	334	394
Dimension D [mm]	120,5	180,5	240,5	300,5	360,5	420,5
Bolts length L [mm]	100	163	224	287	340	400

Subject to technical and dimensional changes without notice

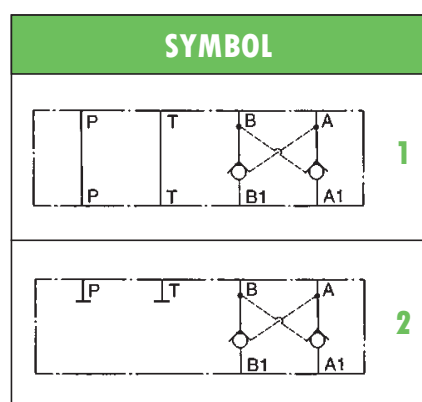
## TYPICAL SECTION

1	Body	6-7	Electrical connector
2-3	Solenoid	8	Retaining nut
4	Spring	9	Emergency pin
5	Spool	10	Plug

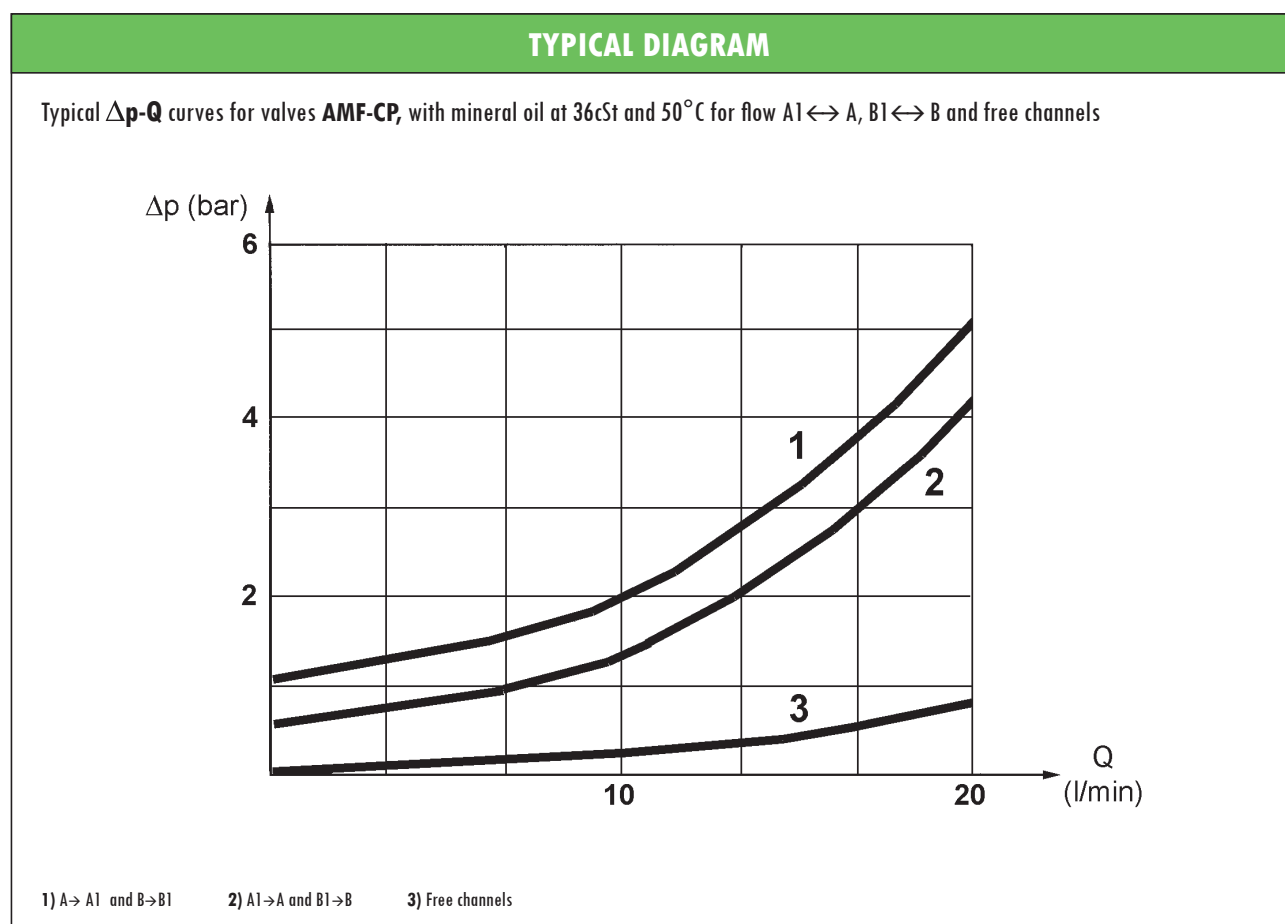


### HYDRAULIC COMPACT STACKABLE CHECK VALVES type **AMF-CP** PILOT OPERATED

- Hydraulic check valves pilot operated
- **AMF / HDF2** interface, stackable assembly
- Pilot ratio 1: 2,2
- Max operating pressure: 250 bar
- Max recommended flow: 20 l/min
- Mass: 0,40 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt

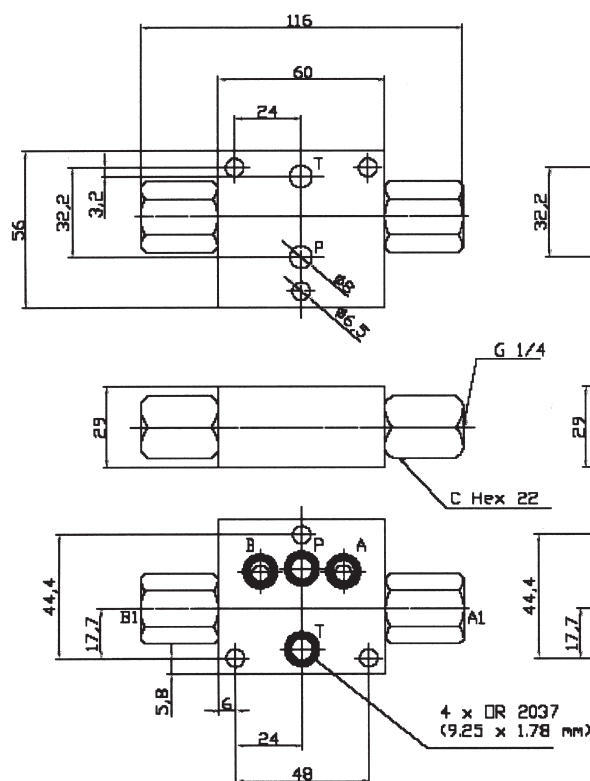


ORDERING CODE	
<b>AMF(C) – CP – AB</b>	
<b>AMF</b>	AMF compact stackable valve - P,T free (see symbol 1)
<b>(C)</b>	End of stackable module - P, T plugged (see symbol 2)
<b>CP</b>	Pilot operated check valve
<b>AB</b>	Dual check valve on A and B

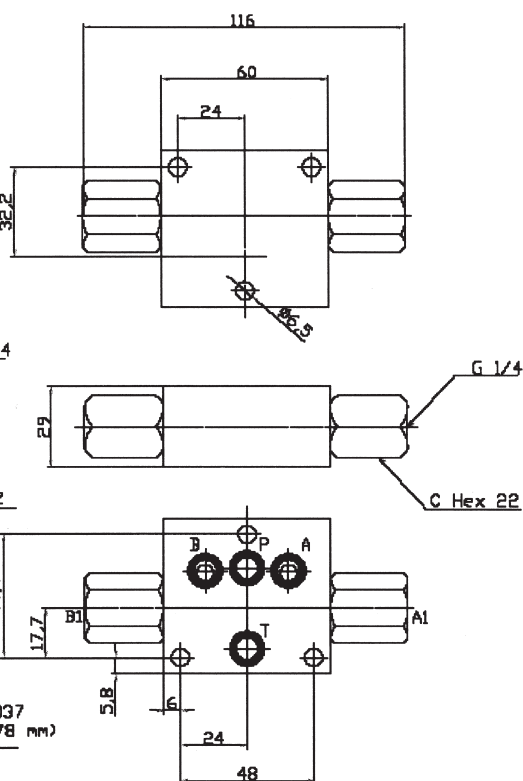


# OVERALL DIMENSIONS

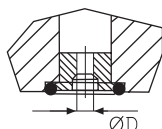
## AMF-CP-AB



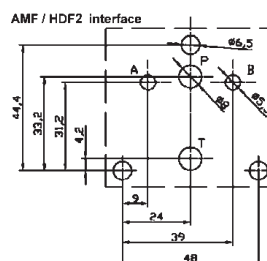
## AMFC-CP-AB



Available for P and T lines 'section reducer' with O ring



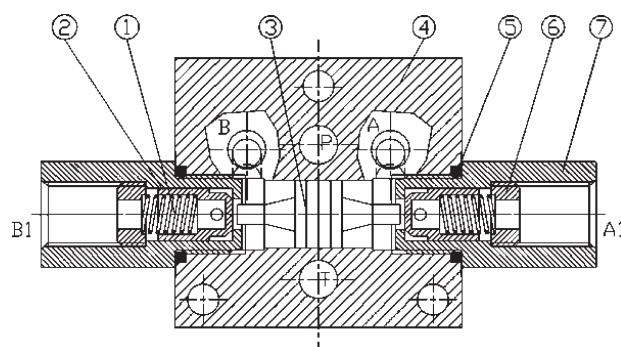
D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25



Subject to technical and dimensional changes without notice

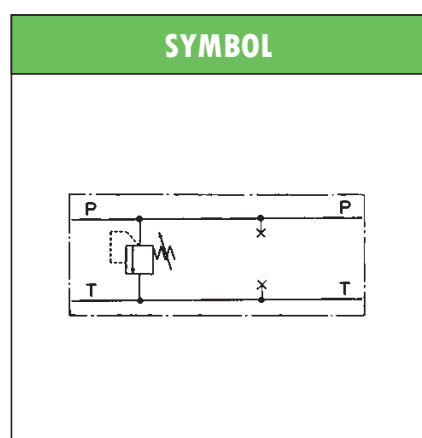
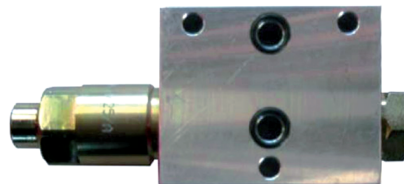
# TYPICAL SECTION

1	Spring	5	Seal
2	Poppet	6	Check device holder
3	Pilot piston	7	Check valve body
4	Main body		

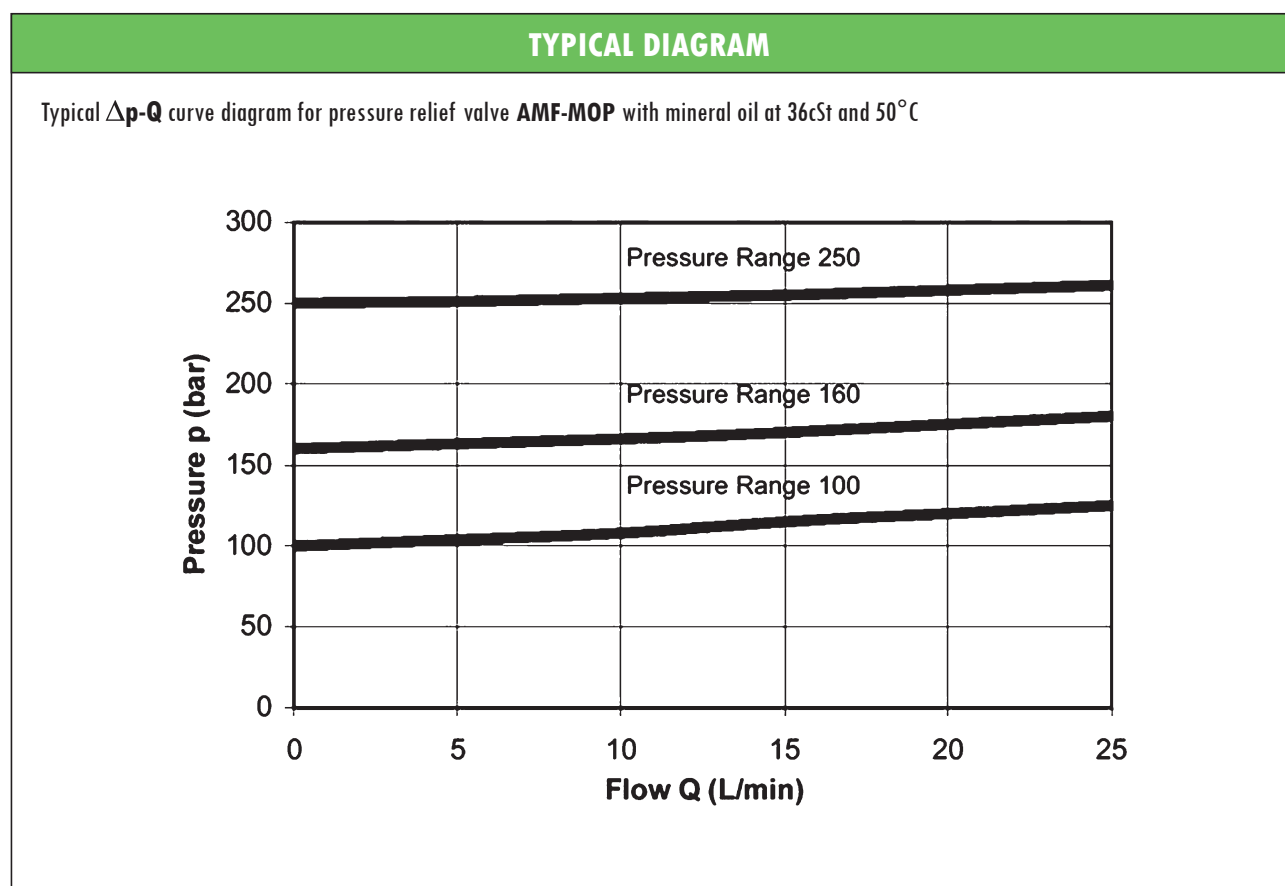


## HYDRAULIC COMPACT STACKABLE VALVES type **AMF-MOP** PRESSURE RELIEF – DIRECT ACTING

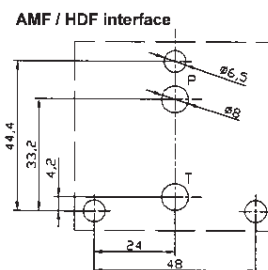
- Hydraulic pressure relief valves, direct acting
- **AMF / HDF** interface, stackable assembly
- Adjustment by nut
- Max operating pressure : 250 bar
- Max recommended flow: 20 l/min
- Mass: 0,30 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



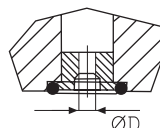
ORDERING CODE	
<b>AMF – MOP / 10</b>	
<b>AMF</b>	AMF compact stackable valve
<b>MOP</b>	Pressure relief on P line, direct acting
<b>10</b>	Setting ranges: <b>10:</b> 32 to 100 bar <b>16:</b> 63 to 160 bar <b>25:</b> 100 to 250 bar



## OVERALL DIMENSIONS



Available for P and T lines section  
reducer with O ring

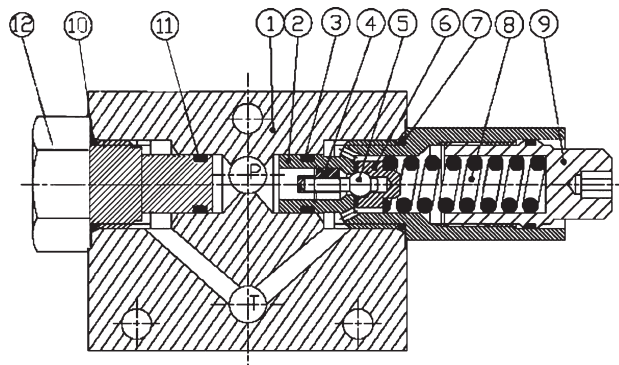


D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25

Subject to technical and dimensional changes without notice

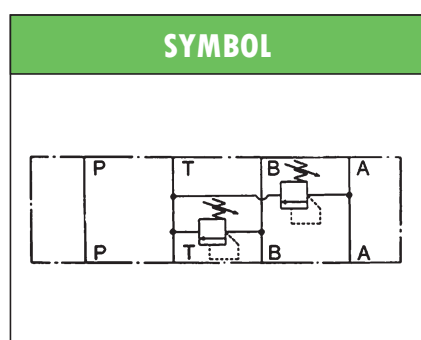
## TYPICAL SECTION

1	Main body	7	Seal
2	Pressure relief valve body	8	Spring
3	Seal	9	Adjustment nut
4	Piston guide	10	Seal
5	Piston	11	Seal
6	Piston holder	12	Plug



## HYDRAULIC COMPACT STACKABLE VALVES type **AMF-MO-AB** PRESSURE RELIEF – DIRECT ACTING

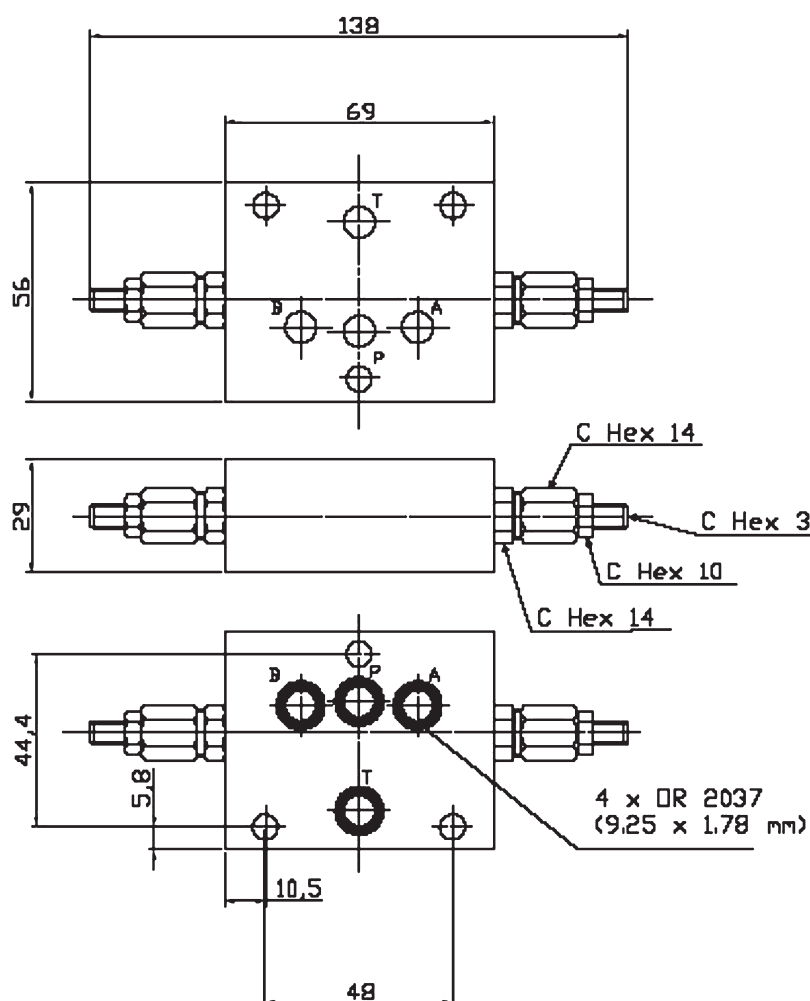
- Hydraulic pressure relief valves, direct acting
- **AMF / HDF** interface, stackable assembly
- Adjustment by screw with locking nut
- Max operating pressure: 250 bar
- Max flow rate: 20 l/min service lines (P, T)  
6 l/min bleeding lines (A, B)
- Mass: 0,30 kg
- Standard pressure range up to 250 bar
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.  
Recommended viscosity range: 10 to 60cSt



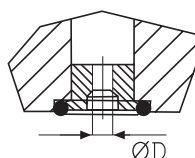
ORDERING CODE	
<b>AMF – MO – AB</b>	
<b>AMF</b>	AMF compact stackable module
<b>MO</b>	Pressure relief, direct acting
<b>AB</b>	Control on A and B lines

TYPICAL SECTION			
<b>1</b>	Valve holder	<b>6</b>	Seal
<b>2</b>	Spring	<b>7</b>	Relief valve body
<b>3</b>	Poppet	<b>8</b>	Locking nut
<b>4</b>	Main body	<b>9</b>	Adjustment screw
<b>5</b>	Seal		

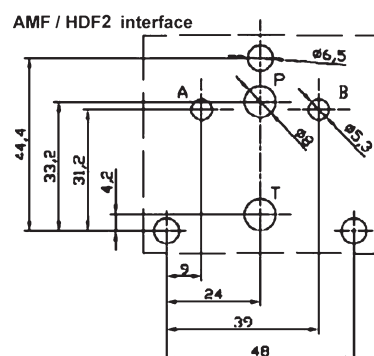


**OVERALL DIMENSIONS**


Available, for P, T, A and B lines,  
a restrictor with O ring

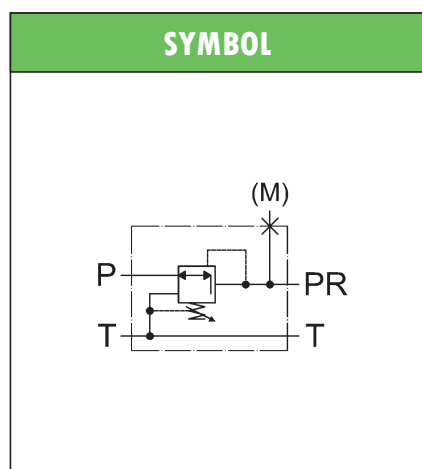
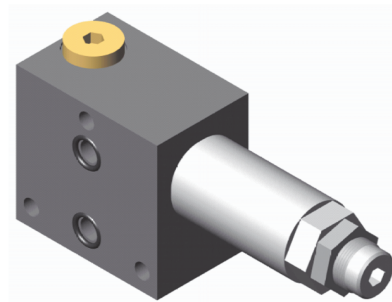


D (mm)	CODE
1,0	35-10
1,5	35-15
2,0	35-20
2,5	35-25

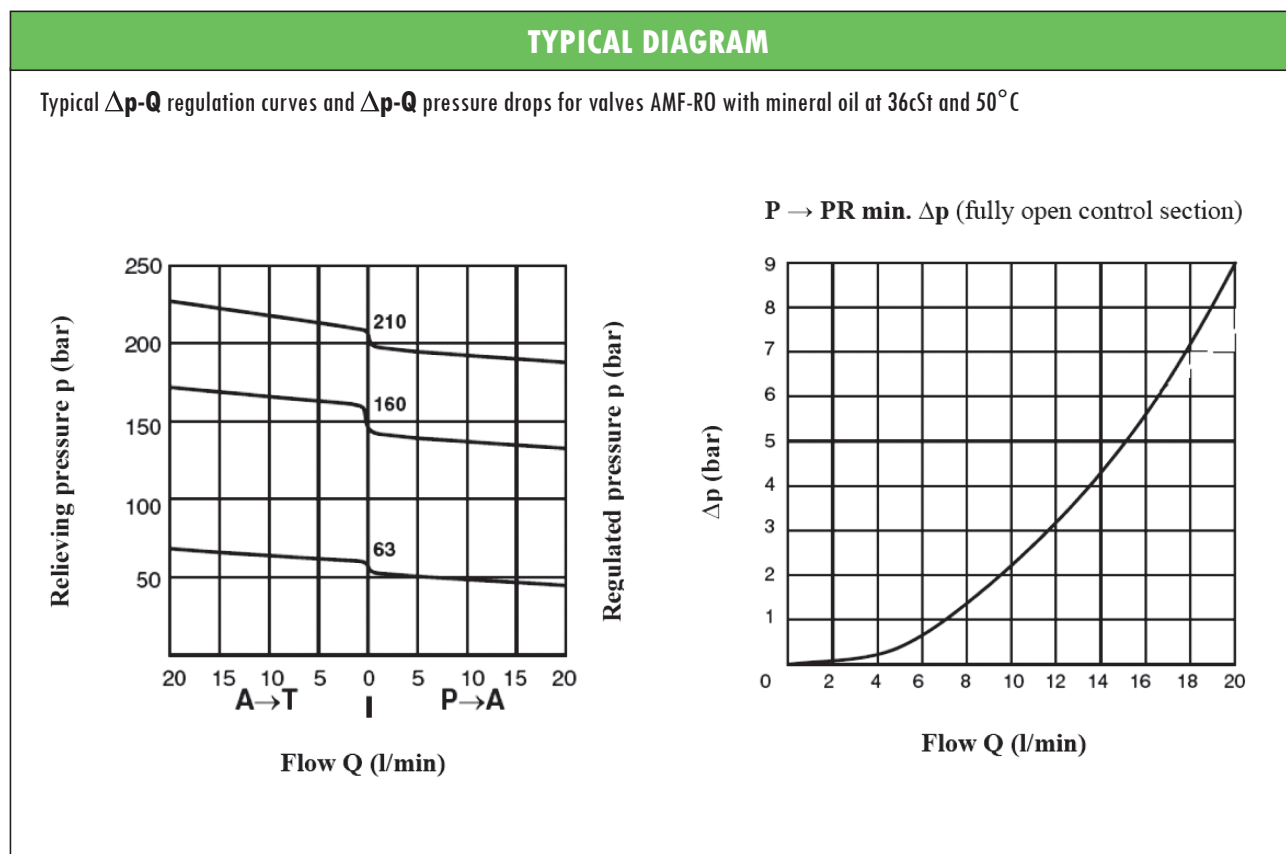


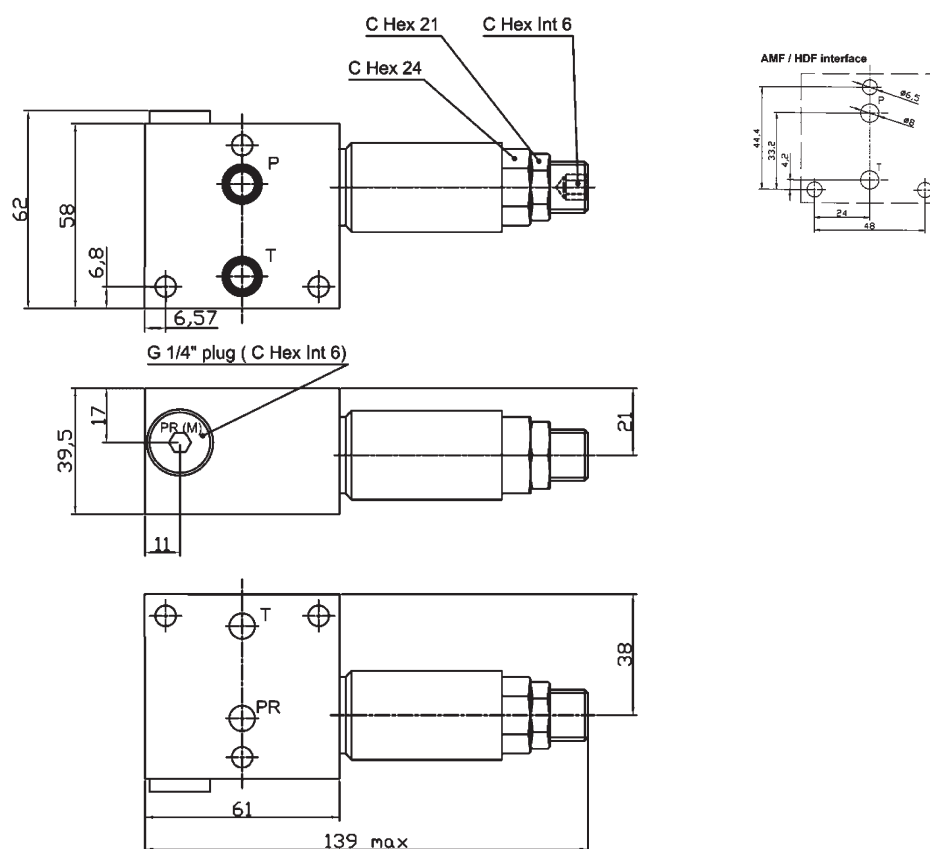
## HYDRAULIC COMPACT STACKABLE VALVES type **AMF-RO** PRESSURE REDUCING - DIRECT ACTING

- Hydraulic pressure reducing valves, direct acting.
- **AMF / HDF** interface, stackable assembly
- Adjustment by screw with locking unit
- Max nominal pressure: 250 bar
- Max reduced pressure: 210 bar
- Max recommended flow: 20 l/min
- Mass: 0,50 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better. Recommended viscosity range: 10 to 60cSt



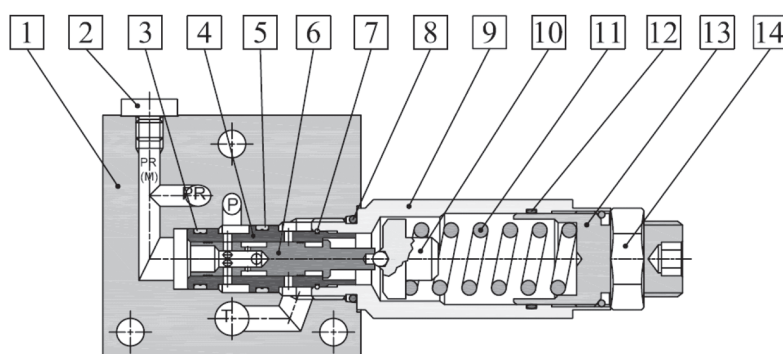
ORDERING CODE	
<b>AMF – RO – P/6,3</b>	
<b>AMF</b>	AMF compact stackable valve
<b>RO</b>	Direct operating pressure reducing
<b>P</b>	Control on P, 3rd way on T line
<b>6,3</b>	Setting range: <b>6,3</b> = 16 to 63 bar <b>16</b> = 40 to 160 bar <b>20</b> = 50 to 210 bar





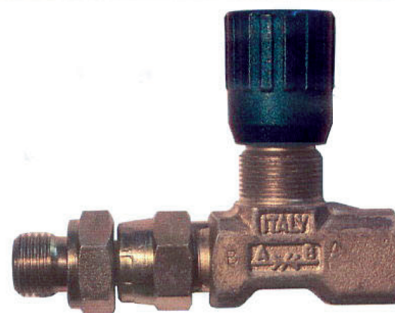
Subject to technical and dimensional changes without notice

<b>1</b>	Main body	<b>8</b>	Seal
<b>2</b>	plug (M port 1/4" BSP)	<b>9</b>	Reducing valve holder
<b>3</b>	Seal	<b>10</b>	Spring holder
<b>4</b>	Reducing valve body	<b>11</b>	Spring
<b>5</b>	Seal	<b>12</b>	Spring holder seal
<b>6</b>	Throttling spool	<b>13</b>	Seal
<b>7</b>	Seal	<b>14</b>	Setting screw

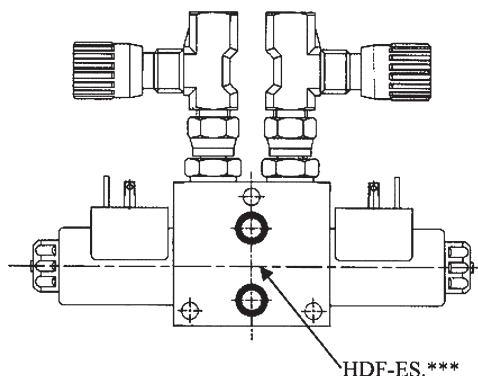
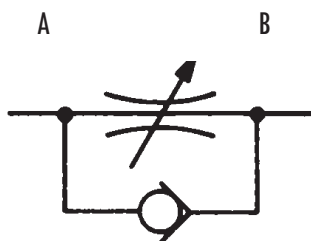


## INLINE THROTTLE VALVE type **HFC-14** **1-WAY - ADJUSTABLE**

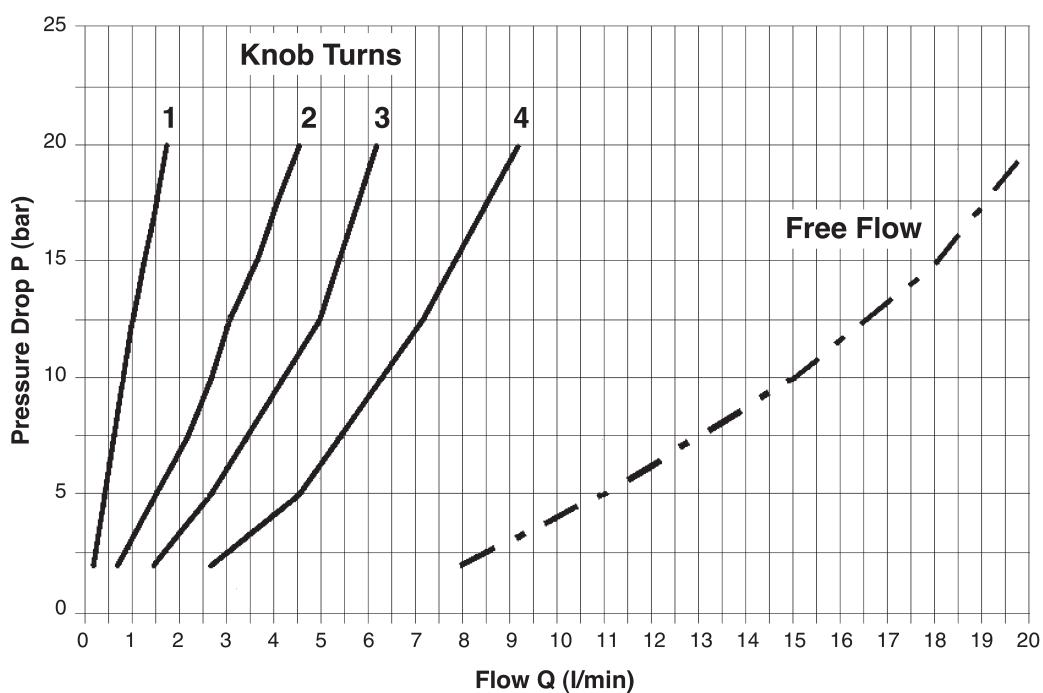
- Flow control valves, needle type
- **1-way flow control**, adjustable
- BSP thread ports for in-line assembly
- **Steel** body, poppet and spring in steel
- Maximum operating pressure: **400 bar**
- Adjustment hand-grip with locking screw
- Special version with rotational joint for easy assembly on **HDF** valves

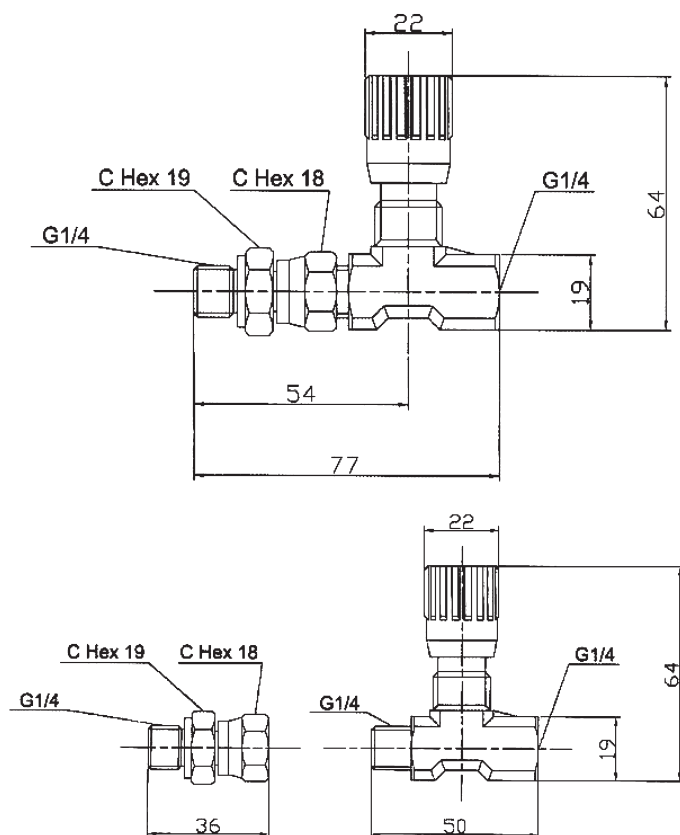


### FUNCTIONAL SYMBOL

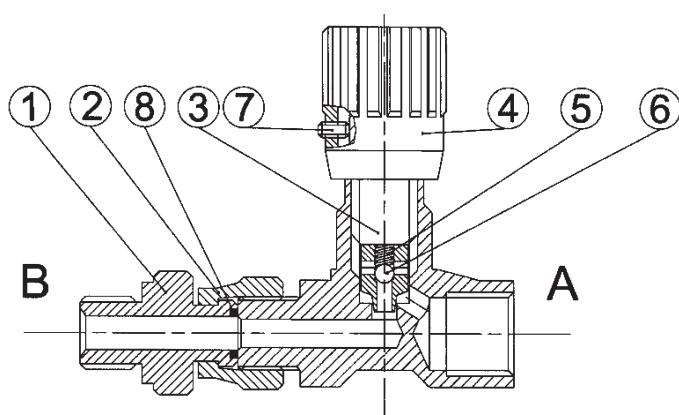


### TYPICAL DIAGRAM





All dimensions are mm



## INSTALLATION

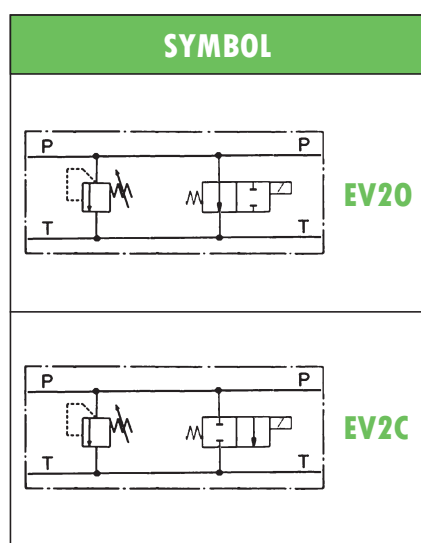
1. Lock the nipple 1 in a G1/4 port.
2. Put O-Ring® in its seat.
3. Fit the male thread of the valve in the turning connector.
4. While keeping the valve in the desired final orientation, screw the turning connector until blocking.

## ADJUSTMENT OF THE REGULATED FLOW

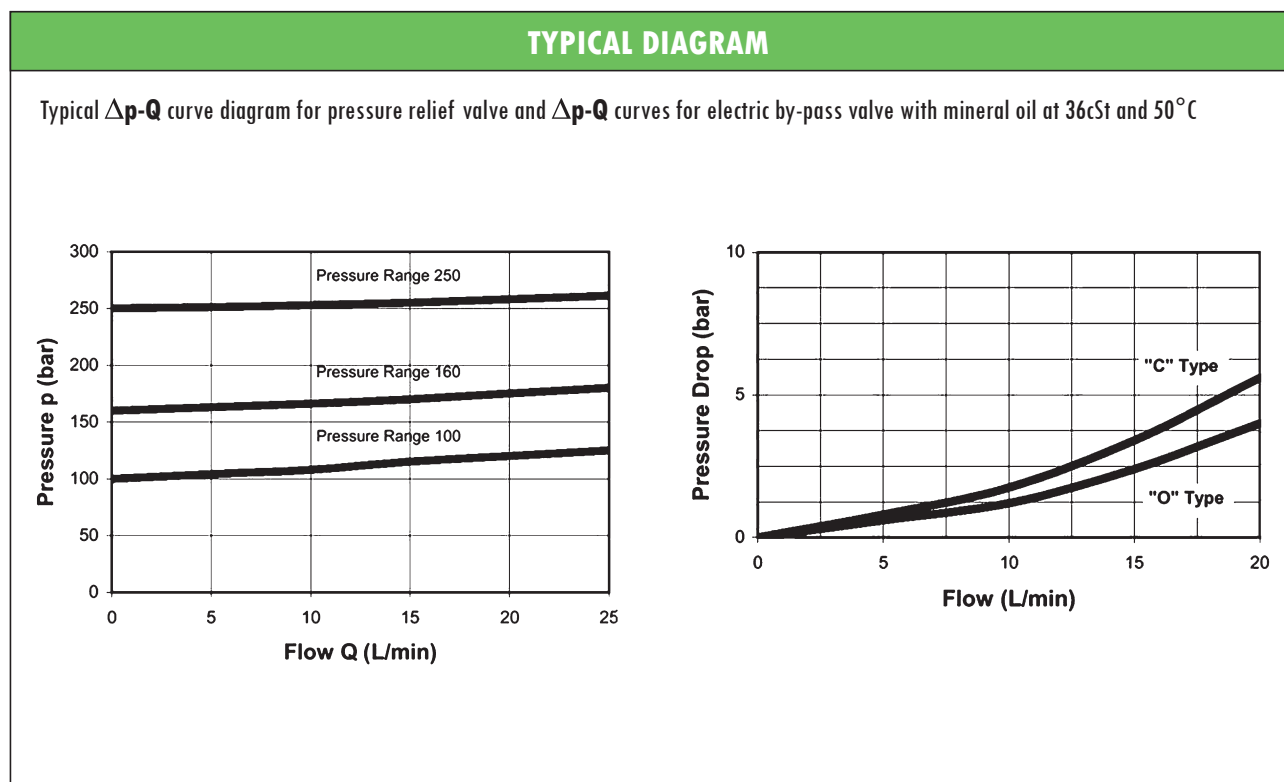
To reduce the flow rate in the regulated direction (A → B) turn clockwise knob 4, after having unlocked its retaining screw 7.

## HYDRAULIC COMPACT STACKABLE MODULE **AMF-MOP-EV** ELECTRIC BY-PASS / PRESSURE CONTROL

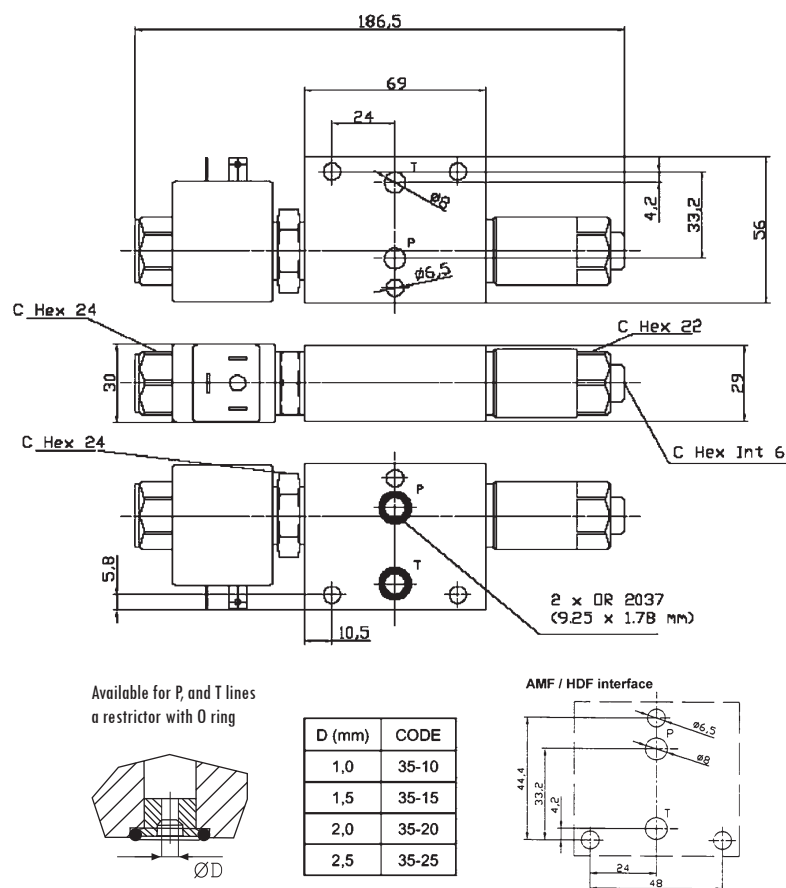
- Hydraulic valve module for pressure control and venting function, by standard 2-way solenoid operated valve and pressure relief valve.
- AMF / HDF** interface, stackable assembly
- Max operating pressure: 250 bar
- Max recommended flow: 20 l/min
- Mass: 0,70 kg
- Suitable for mineral oil according to ISO 18/16/14 filtration class or better.  
Recommended viscosity range: 10 to 60cSt



ORDERING CODE	
<b>AMF – MOP/* – EV20 – 012C</b>	
<b>AMF</b>	AMF compact stackable valve
<b>MOP/*</b>	Pressure relief on P line – (*) setting range ( <b>10</b> =32 to 100bar – <b>16</b> =63 to 160bar – <b>25</b> =100 to 250 bar)
<b>EV20</b>	2-way solenoid operated valve for by-pass: <b>EV20</b> = normally open (see symbol) <b>EV2C</b> = normally closed (see symbol)
<b>012C</b>	Standard coil voltage: <b>012C</b> = 12V DC <b>024C</b> = 24V DC (available on request 220V AC)

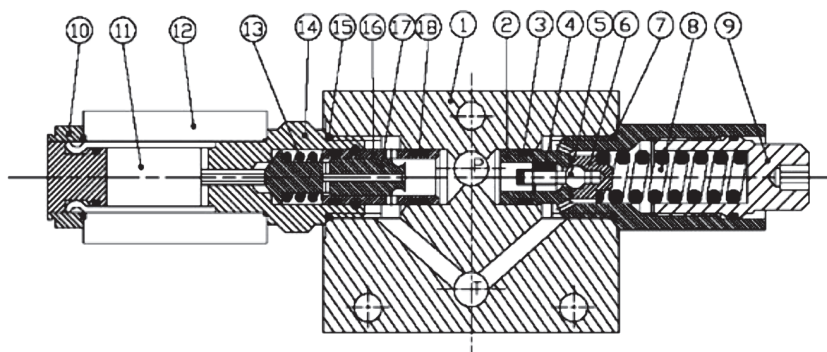






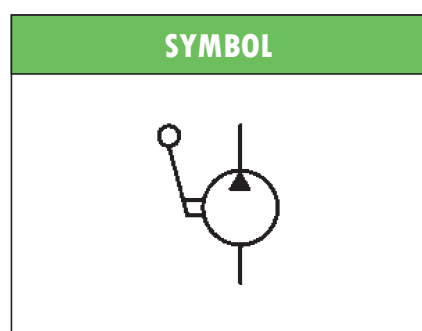
Subject to technical and dimensional changes without notice

<b>1</b>	Main body	<b>10</b>	Ring nut
<b>2</b>	Pressure relief valve body	<b>11</b>	Solenoid
<b>3</b>	Seal	<b>12</b>	Coil
<b>4</b>	Piston guide	<b>13</b>	Spring
<b>5</b>	Piston	<b>14</b>	Cartridge
<b>6</b>	Piston holder	<b>15</b>	Seal
<b>7</b>	Seal	<b>16</b>	Valve body
<b>8</b>	Spring	<b>17</b>	Spool
<b>9</b>	Adjustment nut	<b>18</b>	Seal



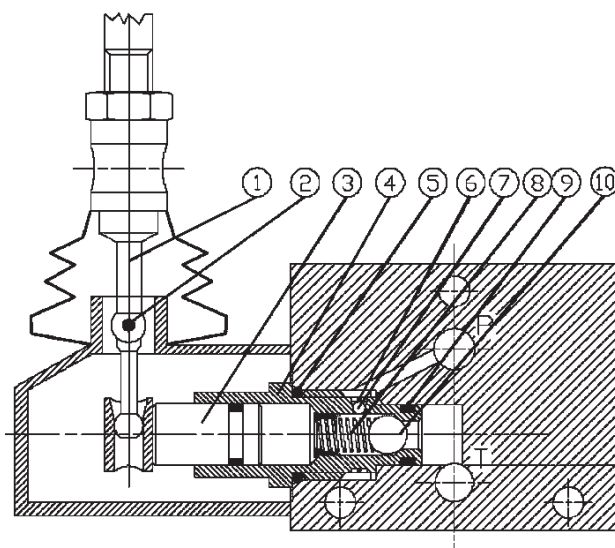
## COMPACT STACKABLE HAND PUMP type **AMF-HP2**

- Fixed displacement hand pump
  - **AMF / HDF** interface, stackable assembly
  - Max operating pressure : 200 bar
  - Displacement: 2 cm<sup>3</sup>
  - Mass: 0,70 kg
  - Suitable for mineral oil according to ISO 18/16/14 filtration class or better.
- Recommended viscosity range: 10 to 60cSt



ORDERING CODE	
<b>AMF – HP2</b>	
<b>AMF</b>	AMF compact stackable module
<b>HP2</b>	Hand pump, displacement 2 cm <sup>3</sup>

TYPICAL SECTION			
<b>1</b>	Lever	<b>6</b>	Valves holder
<b>2</b>	Swivel	<b>7</b>	Outlet valve
<b>3</b>	Piston	<b>8</b>	Spring
<b>4</b>	Piston seat	<b>9</b>	Seal
<b>5</b>	Seal	<b>10</b>	Suction valve



30°

PRESSURE (in P line)

SUCTION (from T line)

2 x OR 2037  
(9.25 x 1.78 mm)

56

5.8

10.5

69

127

39

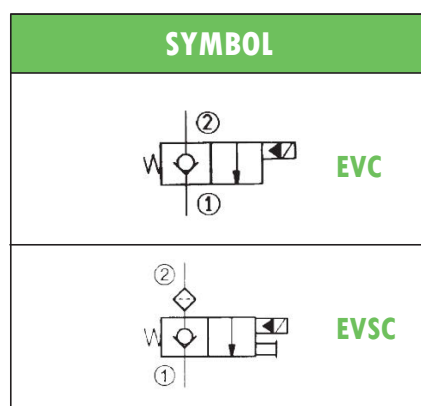
P

T

abco srl Italy - 21013 Gallarate (VA) - Via Olanda, 5 Tel. +39 02 66015524 - Fax +39 02 99984600 e-mail: [info@abco.it](mailto:info@abco.it) - web: [www.abco.it](http://www.abco.it)

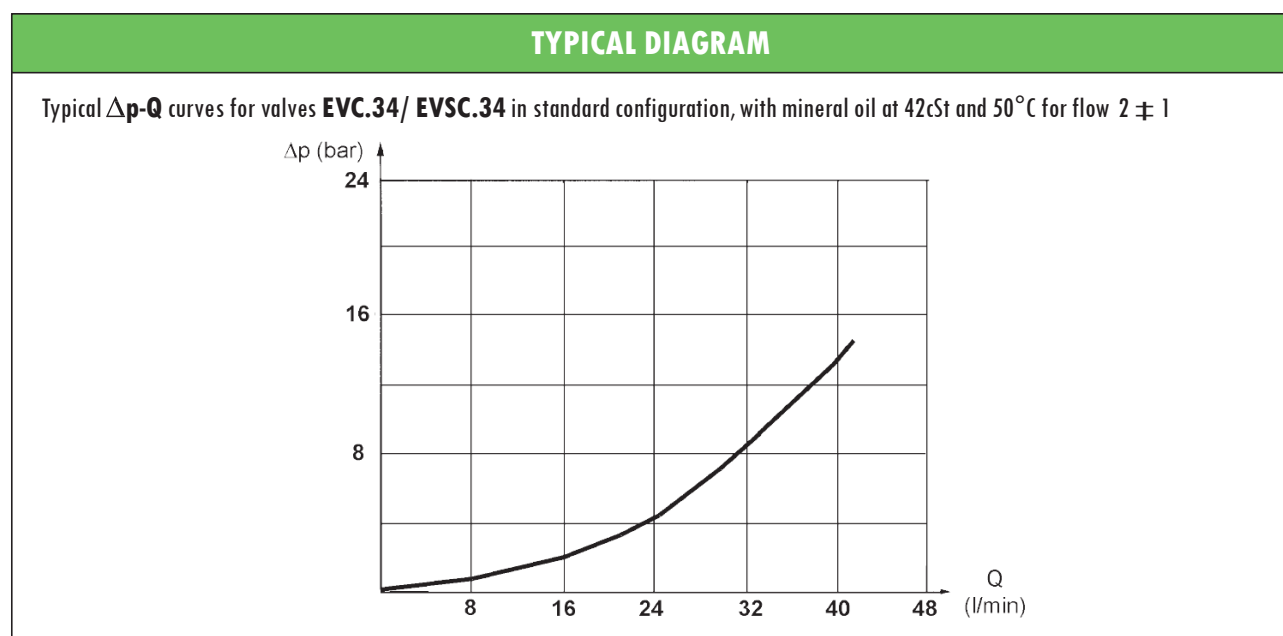
# HYDRAULIC SCREW-IN VALVES type **EVC.34/ EVSC.34** N.C. 1-DIR. FLOW – SOLENOID OPERATED

- Suitable for standard cavity **3/4" 16 UNF**
- **2-way** solenoid operated poppet valves
- Normally closed, one direction flow
- Maximum operating pressure: 250 bar
- Nominal flow rate: 32 l/min
- Maximum flow rate: 40 l/min
- 100% duty cycle
- Steel body
- Poppet in hardened and grinded steel
- Mass 0,32 kg (coil included)



ORDERING CODE
<b>EVC.34.03</b>
2-way solenoid <b>operated</b> poppet valve, cavity 3/4" – 16 UNF
<b>EVSC.34.02</b>
2-way solenoid operated valve, cavity 3/4" – 16 UNF with filter and manual override by screw

COIL	Ø13 / 18W – Plugs (not included) according to ISO 4400: see table AZ-100
<b>C30-012C</b>	<b>12V DC</b> – 1,55A – 7,7Ωat 20°C – 18,6W nominal power – Insulation class F
<b>C30-024C</b>	<b>24V DC</b> – 0,8A – 31Ωat 20°C – 19W nominal power – Insulation class F
<b>C30-220R</b>	<b>230V RAC</b> (rectifier plug needed) – 0,08A – 2500Ωat 20°C – 16W nominal power – Insulation class F



[illegible]

Subject to technical and dimensional changes without notice

Technical drawing of a mechanical part, showing front and top views with dimensions.

**Front View (Left):**

- Overall width: 35
- Overall height: 60
- Inner circular feature diameter:  $\phi 6.5$
- Feature 1 (bottom): Outer diameter 17.5, inner diameter 10.5, height 13.
- Feature 2 (top): Outer diameter 17.5, inner diameter 10.5, height 28.

**Top View (Right):**

- Overall width: 60
- Overall height: 47
- Feature 1 (bottom-left): Width 40, height 10.
- Feature 2 (top-right): Width 30, height 10.
- Feature 3 (bottom-right): Width 10, height 10.
- Feature 4 (top-left): Width 10, height 10.
- Feature 5 (center): Width 10, height 10.
- Feature 6 (center-right): Width 10, height 10.
- Feature 7 (center-left): Width 10, height 10.
- Feature 8 (center-top): Width 10, height 10.
- Feature 9 (center-bottom): Width 10, height 10.
- Feature 10 (center-right-top): Width 10, height 10.
- Feature 11 (center-right-bottom): Width 10, height 10.
- Feature 12 (center-left-top): Width 10, height 10.
- Feature 13 (center-left-bottom): Width 10, height 10.
- Feature 14 (center-top-right): Width 10, height 10.
- Feature 15 (center-top-left): Width 10, height 10.
- Feature 16 (center-bottom-right): Width 10, height 10.
- Feature 17 (center-bottom-left): Width 10, height 10.
- Feature 18 (center-right-top-right): Width 10, height 10.
- Feature 19 (center-right-top-left): Width 10, height 10.
- Feature 20 (center-right-bottom-right): Width 10, height 10.
- Feature 21 (center-right-bottom-left): Width 10, height 10.
- Feature 22 (center-left-top-right): Width 10, height 10.
- Feature 23 (center-left-top-left): Width 10, height 10.
- Feature 24 (center-left-bottom-right): Width 10, height 10.
- Feature 25 (center-left-bottom-left): Width 10, height 10.
- Feature 26 (center-top-right-top): Width 10, height 10.
- Feature 27 (center-top-right-bottom): Width 10, height 10.
- Feature 28 (center-top-left-top): Width 10, height 10.
- Feature 29 (center-top-left-bottom): Width 10, height 10.
- Feature 30 (center-bottom-right-top): Width 10, height 10.
- Feature 31 (center-bottom-right-bottom): Width 10, height 10.
- Feature 32 (center-bottom-left-top): Width 10, height 10.
- Feature 33 (center-bottom-left-bottom): Width 10, height 10.
- Feature 34 (center-right-top-right): Width 10, height 10.
- Feature 35 (center-right-top-left): Width 10, height 10.
- Feature 36 (center-right-bottom-right): Width 10, height 10.
- Feature 37 (center-right-bottom-left): Width 10, height 10.
- Feature 38 (center-left-top-right): Width 10, height 10.
- Feature 39 (center-left-top-left): Width 10, height 10.
- Feature 40 (center-left-bottom-right): Width 10, height 10.
- Feature 41 (center-left-bottom-left): Width 10, height 10.
- Feature 42 (center-top-right-top-right): Width 10, height 10.
- Feature 43 (center-top-right-top-left): Width 10, height 10.
- Feature 44 (center-top-right-bottom-right): Width 10, height 10.
- Feature 45 (center-top-right-bottom-left): Width 10, height 10.
- Feature 46 (center-top-left-top-right): Width 10, height 10.
- Feature 47 (center-top-left-top-left): Width 10, height 10.
- Feature 48 (center-top-left-bottom-right): Width 10, height 10.
- Feature 49 (center-top-left-bottom-left): Width 10, height 10.
- Feature 50 (center-bottom-right-top-right): Width 10, height 10.
- Feature 51 (center-bottom-right-top-left): Width 10, height 10.
- Feature 52 (center-bottom-right-bottom-right): Width 10, height 10.
- Feature 53 (center-bottom-right-bottom-left): Width 10, height 10.
- Feature 54 (center-bottom-left-top-right): Width 10, height 10.
- Feature 55 (center-bottom-left-top-left): Width 10, height 10.
- Feature 56 (center-bottom-left-bottom-right): Width 10, height 10.
- Feature 57 (center-bottom-left-bottom-left): Width 10, height 10.
- Feature 58 (center-right-top-right-top): Width 10, height 10.
- Feature 59 (center-right-top-right-bottom): Width 10, height 10.
- Feature 60 (center-right-top-left-top): Width 10, height 10.
- Feature 61 (center-right-top-left-bottom): Width 10, height 10.
- Feature 62 (center-right-bottom-right-top): Width 10, height 10.
- Feature 63 (center-right-bottom-right-bottom): Width 10, height 10.
- Feature 64 (center-right-bottom-left-top): Width 10, height 10.
- Feature 65 (center-right-bottom-left-bottom): Width 10, height 10.
- Feature 66 (center-left-top-right-top): Width 10, height 10.
- Feature 67 (center-left-top-right-bottom): Width 10, height 10.
- Feature 68 (center-left-top-left-top): Width 10, height 10.
- Feature 69 (center-left-top-left-bottom): Width 10, height 10.
- Feature 70 (center-left-bottom-right-top): Width 10, height 10.
- Feature 71 (center-left-bottom-right-bottom): Width 10, height 10.
- Feature 72 (center-left-bottom-left-top): Width 10, height 10.
- Feature 73 (center-left-bottom-left-bottom): Width 10, height 10.
- Feature 74 (center-top-right-top-right-top): Width 10, height 10.
- Feature 75 (center-top-right-top-right-bottom): Width 10, height 10.
- Feature 76 (center-top-right-top-left-top): Width 10, height 10.
- Feature 77 (center-top-right-top-left-bottom): Width 10, height 10.
- Feature 78 (center-top-right-bottom-right-top): Width 10, height 10.
- Feature 79 (center-top-right-bottom-right-bottom): Width 10, height 10.
- Feature 80 (center-top-right-bottom-left-top): Width 10, height 10.
- Feature 81 (center-top-right-bottom-left-bottom): Width 10, height 10.
- Feature 82 (center-top-left-top-right-top): Width 10, height 10.
- Feature 83 (center-top-left-top-right-bottom): Width 10, height 10.
- Feature 84 (center-top-left-top-left-top): Width 10, height 10.
- Feature 85 (center-top-left-top-left-bottom): Width 10, height 10.
- Feature 86 (center-top-left-bottom-right-top): Width 10, height 10.
- Feature 87 (center-top-left-bottom-right-bottom): Width 10, height 10.
- Feature 88 (center-top-left-bottom-left-top): Width 10, height 10.
- Feature 89 (center-top-left-bottom-left-bottom): Width 10, height 10.
- Feature 90 (center-bottom-right-top-right-top): Width 10, height 10.
- Feature 91 (center-bottom-right-top-right-bottom): Width 10, height 10.
- Feature 92 (center-bottom-right-top-left-top): Width 10, height 10.
- Feature 93 (center-bottom-right-top-left-bottom): Width 10, height 10.
- Feature 94 (center-bottom-right-bottom-right-top): Width 10, height 10.
- Feature 95 (center-bottom-right-bottom-right-bottom): Width 10, height 10.
- Feature 96 (center-bottom-right-bottom-left-top): Width 10, height 10.
- Feature 97 (center-bottom-right-bottom-left-bottom): Width 10, height 10.
- Feature 98 (center-bottom-left-top-right-top): Width 10, height 10.
- Feature 99 (center-bottom-left-top-right-bottom): Width 10, height 10.
- Feature 100 (center-bottom-left-top-left-top): Width 10, height 10.
- Feature 101 (center-bottom-left-top-left-bottom): Width 10, height 10.
- Feature 102 (center-bottom-left-bottom-right-top): Width 10, height 10.
- Feature 103 (center-bottom-left-bottom-right-bottom): Width 10, height 10.
- Feature 104 (center-bottom-left-bottom-left-top): Width 10, height 10.
- Feature 105 (center-bottom-left-bottom-left-bottom): Width 10, height 10.
- Feature 106 (center-top-right-top-right-top-right): Width 10, height 10.
- Feature 107 (center-top-right-top-right-top-left): Width 10, height 10.
- Feature 108 (center-top-right-top-right-bottom-right): Width 10, height 10.
- Feature 109 (center-top-right-top-right-bottom-left): Width 10, height 10.
- Feature 110 (center-top-right-top-left-top-right): Width 10, height 10.
- Feature 111 (center-top-right-top-left-top-left): Width 10, height 10.
- Feature 112 (center-top-right-top-left-bottom-right): Width 10, height 10.
- Feature 113 (center-top-right-top-left-bottom-left): Width 10, height 10.
- Feature 114 (center-top-right-bottom-right-top-right): Width 10, height 10.
- Feature 115 (center-top-right-bottom-right-top-left): Width 10, height 10.
- Feature 116 (center-top-right-bottom-right-bottom-right): Width 10, height 10.
- Feature 117 (center-top-right-bottom-right-bottom-left): Width 10, height 10.
- Feature 118 (center-top-right-bottom-left-top-right): Width 10, height 10.
- Feature 119 (center-top-right-bottom-left-top-left): Width 10, height 10.
- Feature 120 (center-top-right-bottom-left-bottom-right): Width 10, height 10.
- Feature 121 (center-top-right-bottom-left-bottom-left): Width 10, height 10.
- Feature 122 (center-top-left-top-right-top-right): Width 10, height 10.
- Feature 123 (center-top-left-top-right-top-left): Width 10, height 10.
- Feature 124 (center-top-left-top-right-bottom-right): Width 10, height 10.
- Feature 125 (center-top-left-top-right-bottom-left): Width 10, height 10.
- Feature 126 (center-top-left-top-left-top-right): Width 10, height 10.
- Feature 127 (center-top-left-top-left-top-left): Width 10, height 10.
- Feature 128 (center-top-left-top-left-bottom-right): Width 10, height 10.
- Feature 129 (center-top-left-top-left-bottom-left): Width 10, height 10.
- Feature 130 (center-top-left-bottom-right-top-right): Width 10, height 10.
- Feature 131 (center-top-left-bottom-right-top-left): Width 10, height 10.
- Feature 132 (center-top-left-bottom-right-bottom-right): Width 10, height 10.
- Feature 133 (center-top-left-bottom-right-bottom-left): Width 10, height 10.
- Feature 134 (center-top-left-bottom-left-top-right): Width 10, height 10.
- Feature 135 (center-top-left-bottom-left-top-left): Width 10, height 10.
- Feature 136 (center-top-left-bottom-left-bottom-right): Width 10, height 10.
- Feature 137 (center-top-left-bottom-left-bottom-left): Width 10, height 10.
- Feature 138 (center-bottom-right-top-right-top-right): Width 10, height 10.
- Feature 139 (center-bottom-right-top-right-top-left): Width 10, height 10.
- Feature 140 (center-bottom-right-top-right-bottom-right): Width 10, height 10.
- Feature 141 (center-bottom-right-top-right-bottom-left): Width 10, height 10.
- Feature 142 (center-bottom-right-top-left-top-right): Width 10, height 10.
- Feature 143 (center-bottom-right-top-left-top-left): Width 10, height 10.
- Feature 144 (center-bottom-right-top-left-bottom-right): Width 10, height 10.
- Feature 145 (center-bottom-right-top-left-bottom-left): Width 10, height 10.
- Feature 146 (center-bottom-right-bottom-right-top-right): Width 10, height 10.
- Feature

Code	Ports
LAB-34-2/14	1/4" BSP
LAB-34-2/38	3/8" BSP
Mass: 0,25 kg	

Designed for in-line assembly, either parallel or in series one, LAB aluminium bodies are supplied with one service port (1) plugged.



**abco srl**

**ITALY**

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**Quality System Certified**  
**UNI EN ISO 9001:2008**