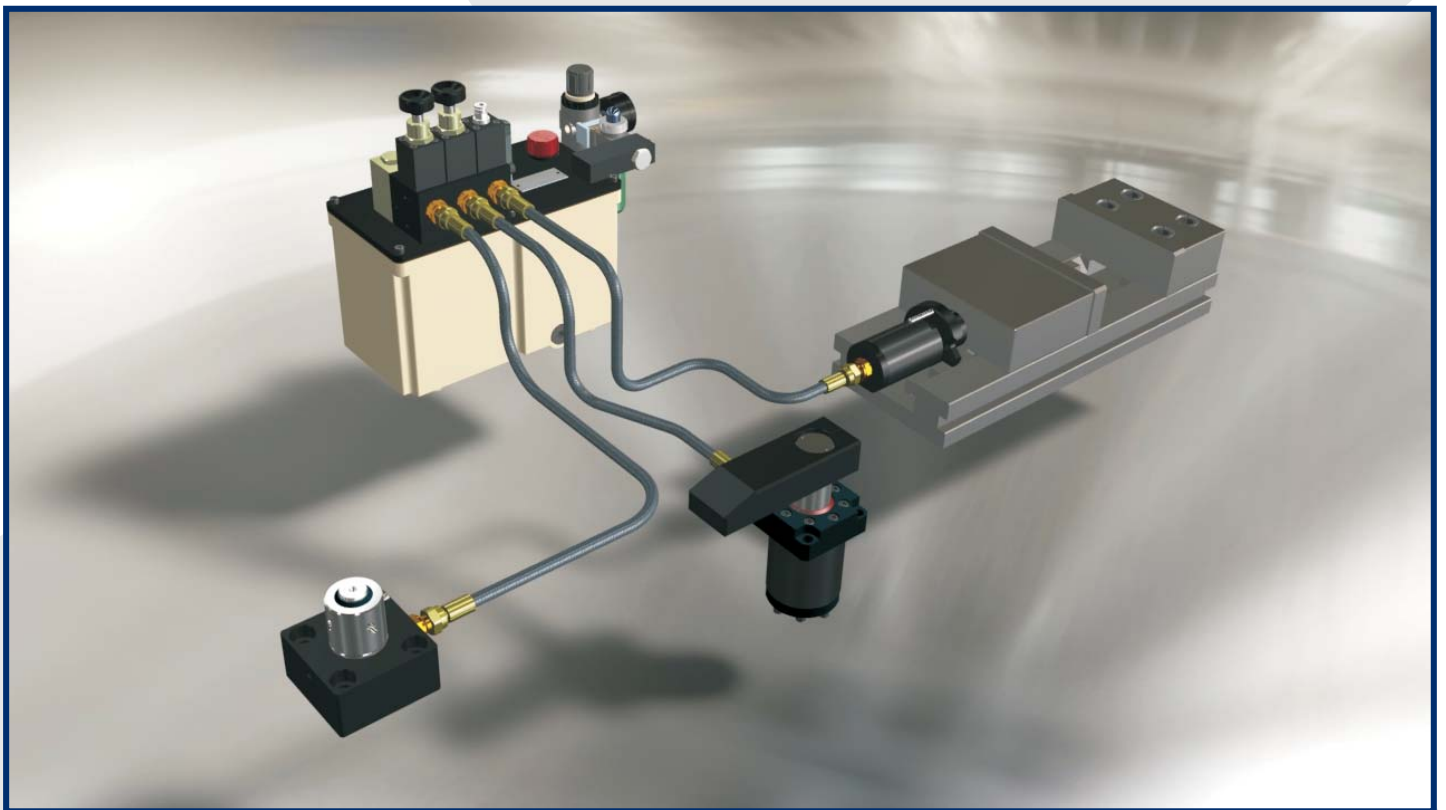




TECNOFLUID

ENGINEERING



HYDRAULIC POWER LOCKING UNIT

HYDRAULIC POWER LOCKING UNIT 5-1563



Requirements

The system consists of hydropneumatic power unit **5-1563-*-***, that shall be provided with distribution blocks (see the relevant specific documents).

This device can be used for all hydraulic applications requiring constant flow-rate, because – owing to its peculiar nature, it can produce a pulsing hydraulic flow.

Figure 1 shows a typical application of the hydraulic locking power unit **5-1563-*-***, complete with 3 hydraulic control blocks: The first one is a basic pneumatic control (**2-1403-0**), the second one is an additional pneumatic control (**2-1405-0**) while the third is an additional manual control (**2-1406-0**).

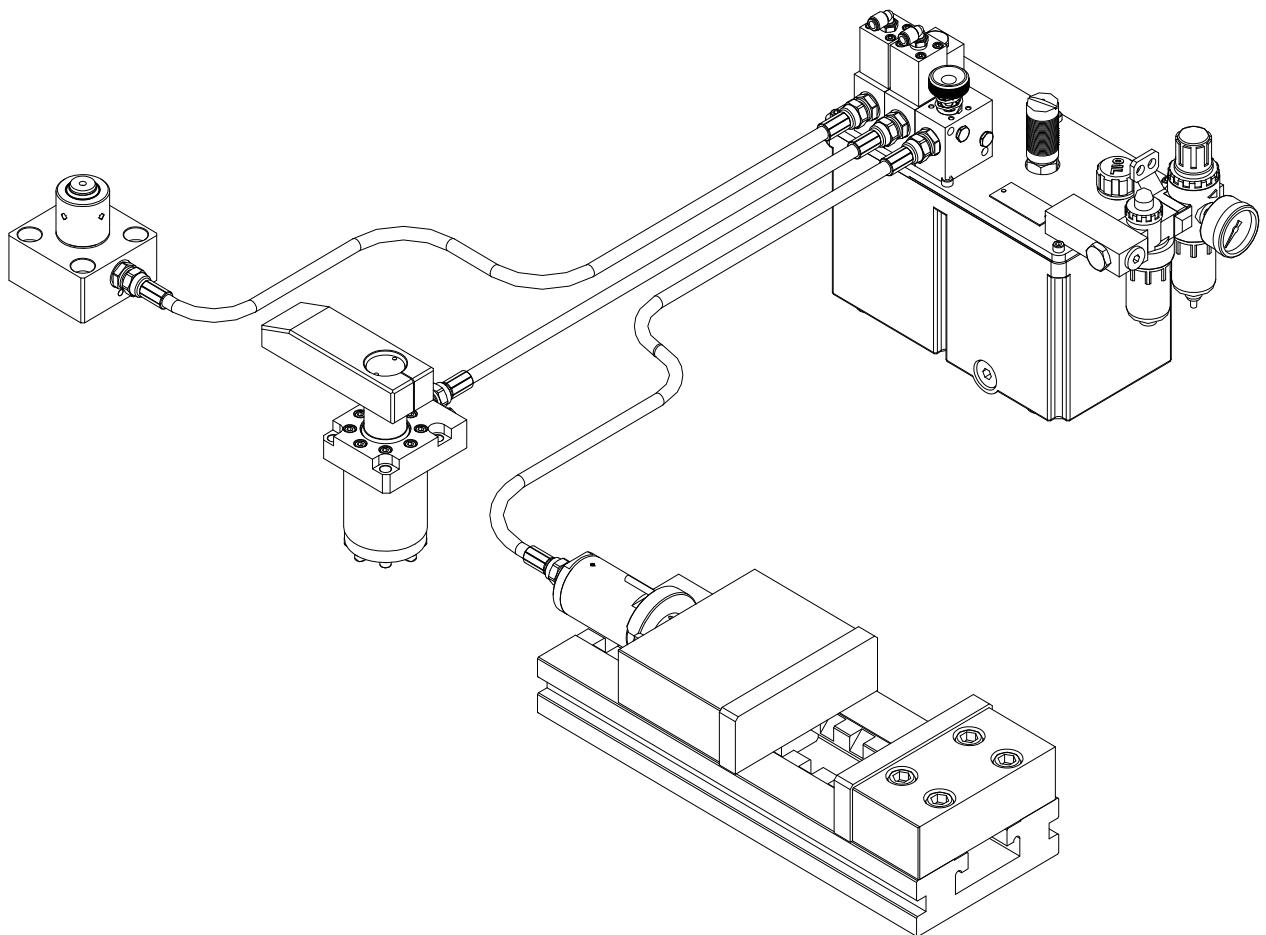


fig.1

Characteristics

In addition to its extremely reduced overall dimensions, this system can maintain the internal pressure of the connected hydraulic devices without using electric motors, because the power unit is equipped with a pneumatic engine.

The modular design of this device makes it possible to increase the number of the independently-controlled device, up to a maximum of six.

The hydraulic distributors available on these power units are fit for controlling single-acting hydraulic systems; if you wish to control a double-acting system, use also two distributor blocks for every single device or 4-way control blocks.

These power units are available in five versions, that differ by the maximum pressure which can be reached.

Furthermore, they are available with a Nylon or painted aluminium tank.

Owing to their peculiar structural characteristics, these power units can be used also under heavy environmental conditions, in the presence of dust, vapours, chips etc.

Hydraulic diagrams

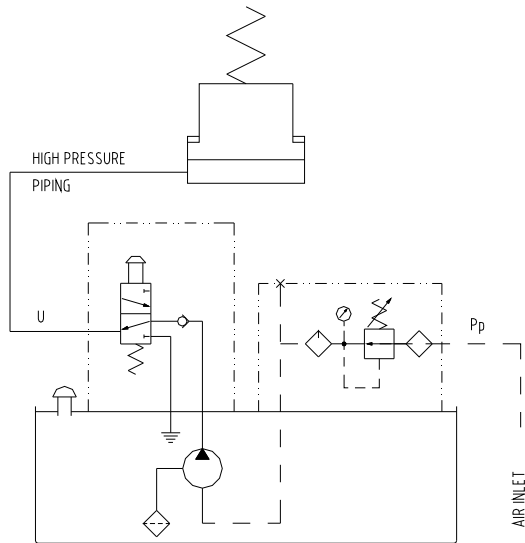


fig.2

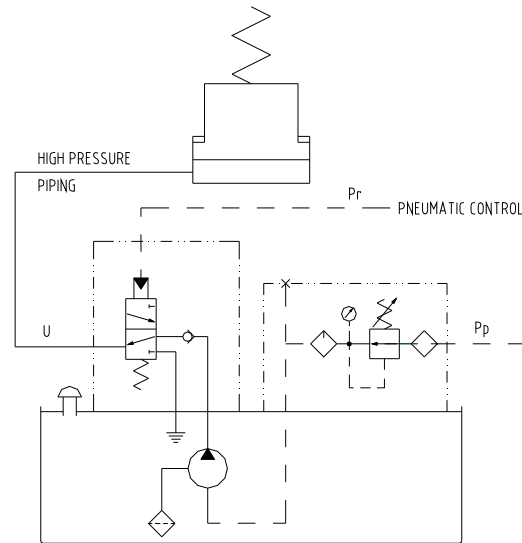


fig.3

Figure 2 shows the hydraulic diagram of power unit **5-1563-***, with manual control distributor **2-1398-0**, while figure 3 shows power unit **5-1563-***, with pneumatic control distributor **2-1403-0**.

The connection to the device is very simple: directly connect the power unit to the hydraulic device by a flexible HP hose, to be connected to the compressed air line.

The symbols used in figures 2 and 3 indicate:

Pp = pneumatic feed, **Pr** = remote pneumatic control inlet, **U** = connection to the hydraulic device.

Operating principle

The hydropneumatic power units' operating principle is based on the difference in section between the hydraulic part and the pneumatic part of the pump mounted inside them: the greater the difference, the more the pressure actually delivered; on the contrary, the greater the hydraulic pressure, the lower the flow-rate provided by the system within the time unit.

Diagram of connections with optional elements

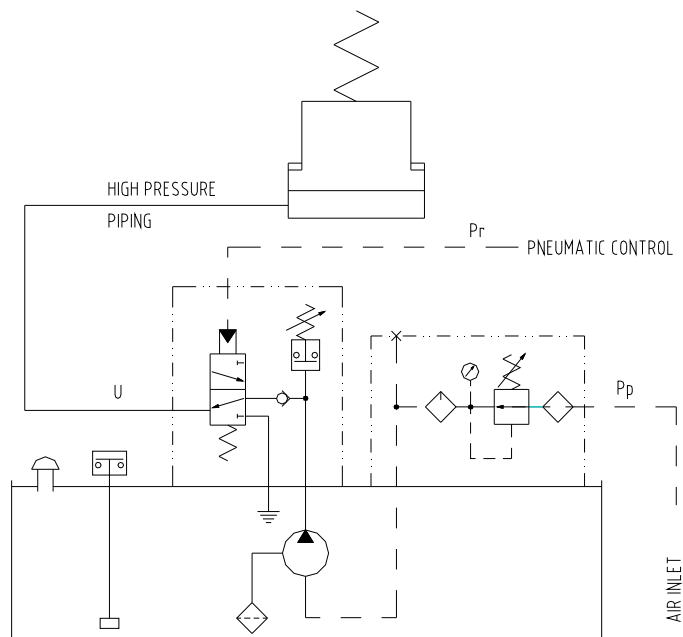


fig. 4

Operation with manual control power unit 5-1563-*-* (diagram in figure 2)

The system shown in the figure must be fed by a compressed airline.

This line feeds the hydropneumatic pump mounted on the power unit's tank; the pump, once actuated, conveys oil under pressure to the hydraulic device by a HP pipe.

The pressure delivered by the pump is based on the pneumatic feed pressure.

This value is adjusted by a pressure reducer mounted on the power unit.

The pneumatic pressure provided to the power unit generates a constant pressure; in order to discharge the connected devices, press the push-button located on the hydraulic control block mounted on the power unit cover.

Press this push-button to switch the distributor box located inside the block. The distributor box switching stops the hydraulic flow from the hydropneumatic pump, connects the hydraulic device to the power unit's discharge and allows the oil under pressure to freely flow into its tank.

To put the hydraulic device connected to the power unit under pressure again, simply pull the control block's push-button upwards. The box inside it moves and locks the discharge line, and connects the hydropneumatic pump's delivery line to the device connected to the power unit.

In a plant consists of several devices (up to six per power unit), the pressure drop in the common delivery line to the different blocks does not affect the locking pressure of the devices under pressure, owing to the non-return valves positioned between every single block and the common delivery line to the hydropneumatic pump.

Operation of pneumatic control power unit 5-1563-*-* (diagram in figure 3)

The operating principle is substantially the same, except for the installation of one or more remote pneumatic control distributors, instead of those controlled by means of a push-button.

The pneumatic control of the power unit's distributor box makes it possible to actuate the distributor directly from a switchboard, by means of a 3-way pneumatic electrovalve; otherwise the box can be controlled by a pneumatic pedal or a manual-control pneumatic valve.

The use of the pneumatic control is highly recommended whenever the power unit is located in a difficult access site (e.g. work areas of machine tools).

Optionals (diagram in figure 4)

All types of power unit can be provided (on demand) with an electric level switch and a MP pressure switch.

The level switch – that can be provided with either a normally open or a normally closed contact – must send an emergency signal to the machine where the system is installed, whenever the oil level in the power unit drops below the minimum, to prevent any sudden lack of pressure in the hydraulic devices.

This function is performed also by the MP pressure switch, that will allow operation providing that hydraulic pressure is available on the common delivery line to the distributor blocks.

Regarding the pneumatic-control power unit, the pressure switch indicates that pressure is available also when the power unit is switched to the discharge mode, because the pressure switch is mounted upstream of the distributor unit; in this case it is advisable to install an electric control circuit to prevent operation of the systems coupled to the power unit when the latter is in discharge mode.

Power unit 5-1563-*. * + 2-1398-0 (figure 5)

Figure 5 shows the external view of manual-control power unit **5-1563-*. ***. The device consists of a semi-transparent nylon or painted aluminium tank (capacity: approx. 2.5 liters) and an anodized aluminium cover, on which the filter-reducer-lubricator unit, the hydropneumatic pump's exhaust silencer, the fill cap, the electrical connector of the level switch (if any) and the hydraulic distributor unit are secured.

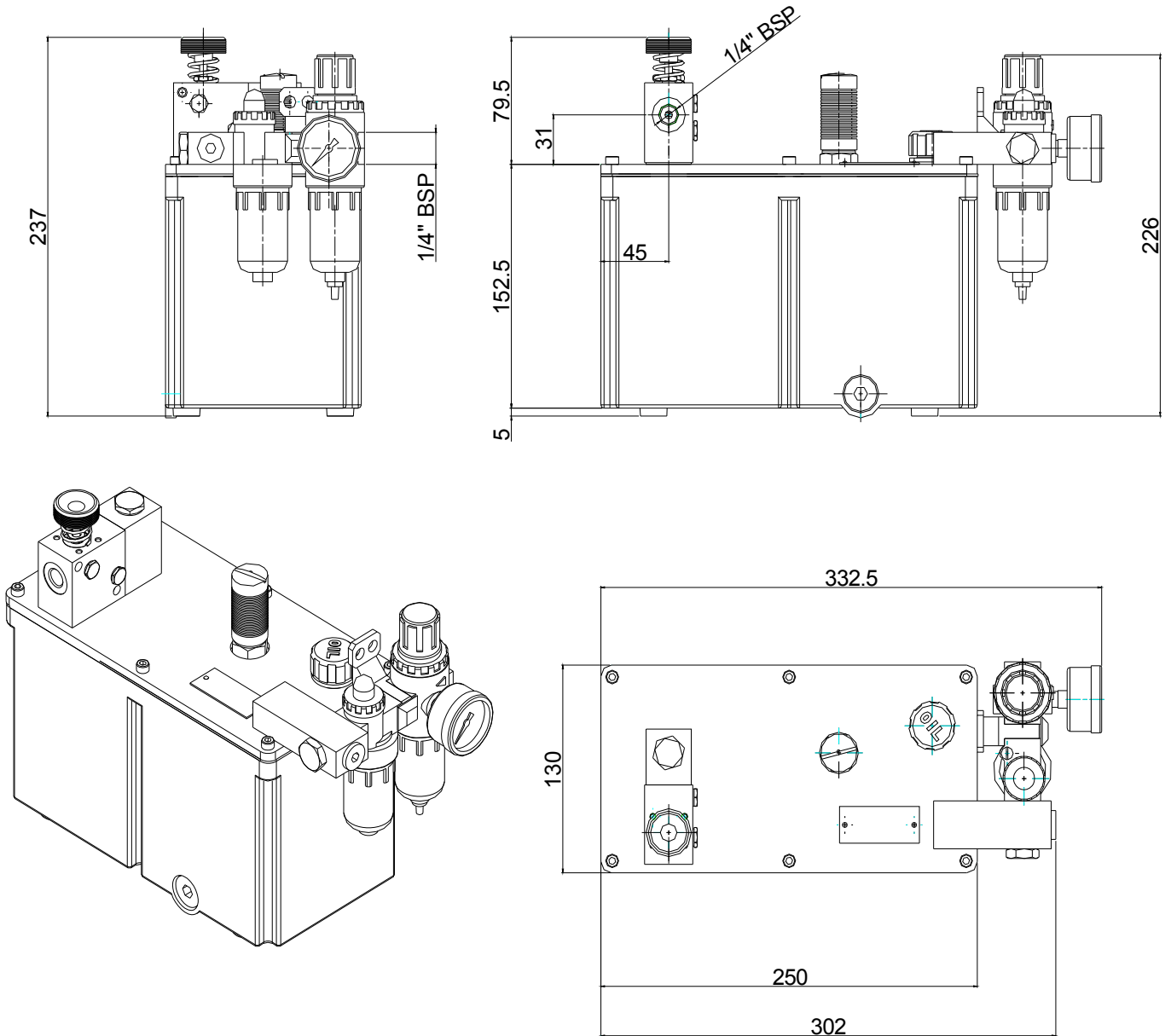


fig.5

Power unit 5-1563-*-* + 2-1403-0 (figure 6)

Figure 6 shows the external view of pneumatic-control power unit **5-1563-*-***. The elements of this power unit are the ones used for the manual-control power unit, except for the hydraulic discharge unit, which is provided with a small pneumatic control cylinder, instead of a manual push-button.

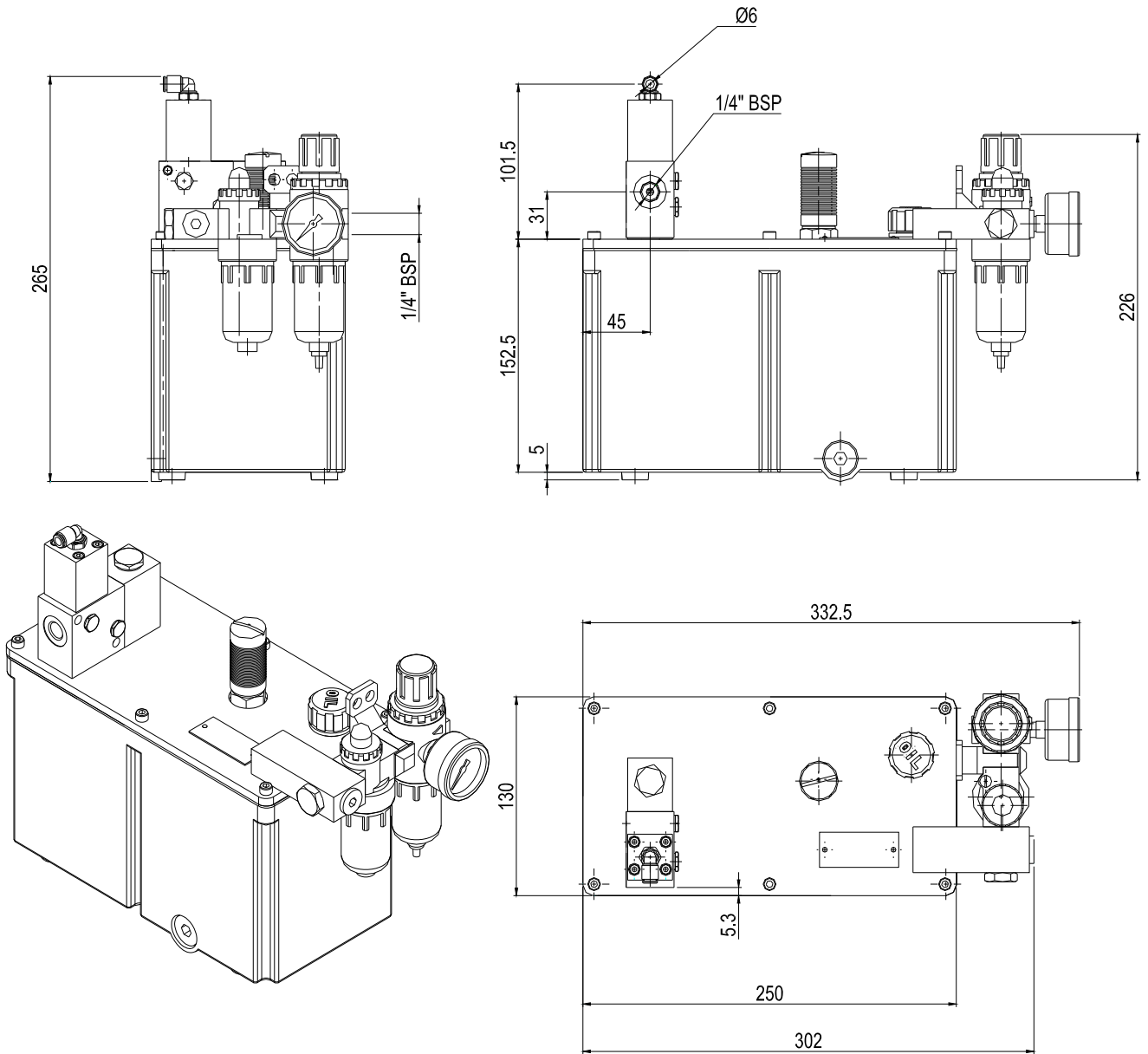


fig.6

Technical data

MAXIMUM OIL VISCOSITY	10° Engler
MAXIMUM OIL TEMPERATURE	90°C
AMBIENT TEMPERATURE	-10 +50°C
MINIMUM ENSURED CAPACITY OF THE POWER UNIT	0,06 l/1'
MIN. PNEUMATIC FEED PRESSURE	1.5 bar
MAX. PNEUMATIC FEED PRESSURE	7 bar
DIAMETER OF PNEUMATIC FEED INLET	1/4" G.
DIAMETER OF HYDRAULIC DUCT CONNECTION	1/4" G.
MINIMUM PRESSURE/RETURN ON THE BLOCK	500 bar
MAXIMUM PERMISSIBLE VOLTAGE ON LEVEL SWITCH	50 W
MAXIMUM PERMISSIBLE PRESSURE ON PRESSURE SWITCH	42V. 4A. AC 42V. 2A. DC

Useful installation tips

If you decide to install a hydraulic locking system with hydropneumatic power units, do not forget a few general considerations:

- The piping which connects the power unit to the hydraulic devices must be of the HP type.
- The hydraulic devices must consist of components fit for the pressure delivered by the power unit.
- Use oil **CASTROL HISPYN AWS 68** to prevent unexpected wear.
- The power unit must be mounted in horizontal position, as near as possible to the devices.
- The piping that, starting from the power unit, transmits pressure to the devices can be either rigid or flexible, providing that the duct is of the HP type.
- The compressed air which feeds the pump must be dry and properly lubricated (a drop of oil every about twenty pump strokes of the power unit).
 - It is advisable to position the power unit in a position easy to reach, so as to facilitate maintenance operations (oil topping up, condensate drainage etc.).
- The oil used in the power unit must be perfectly filtered, since the suspended metal particles would cause irreparable damage to the system; in any case, the oil viscosity must not exceed the maximum expected viscosity.
- During the first start-up of the system, it could be imperative to fire the pump; to do this, simply reset the pneumatic feed pressure by the reducer connected to the power unit; then unscrew the hexagonal drain cap (using a 11mm wrench) mounted on the side of the hydraulic block; then put the power unit under pressure gradually, up until the oil overflows from the seat of the removed cap. Then reset the pneumatic pressure and mount the hexagonal cap; make sure that the cap seal is positioned properly.
- We recommend that you do not use liquid Teflon for the assembly of connecting joints between the device and the power unit; where you cannot use metal-rubber washers, we recommend that you adopt conical thread fittings and use a Teflon tape for sealing.

Air-oil compression ratios

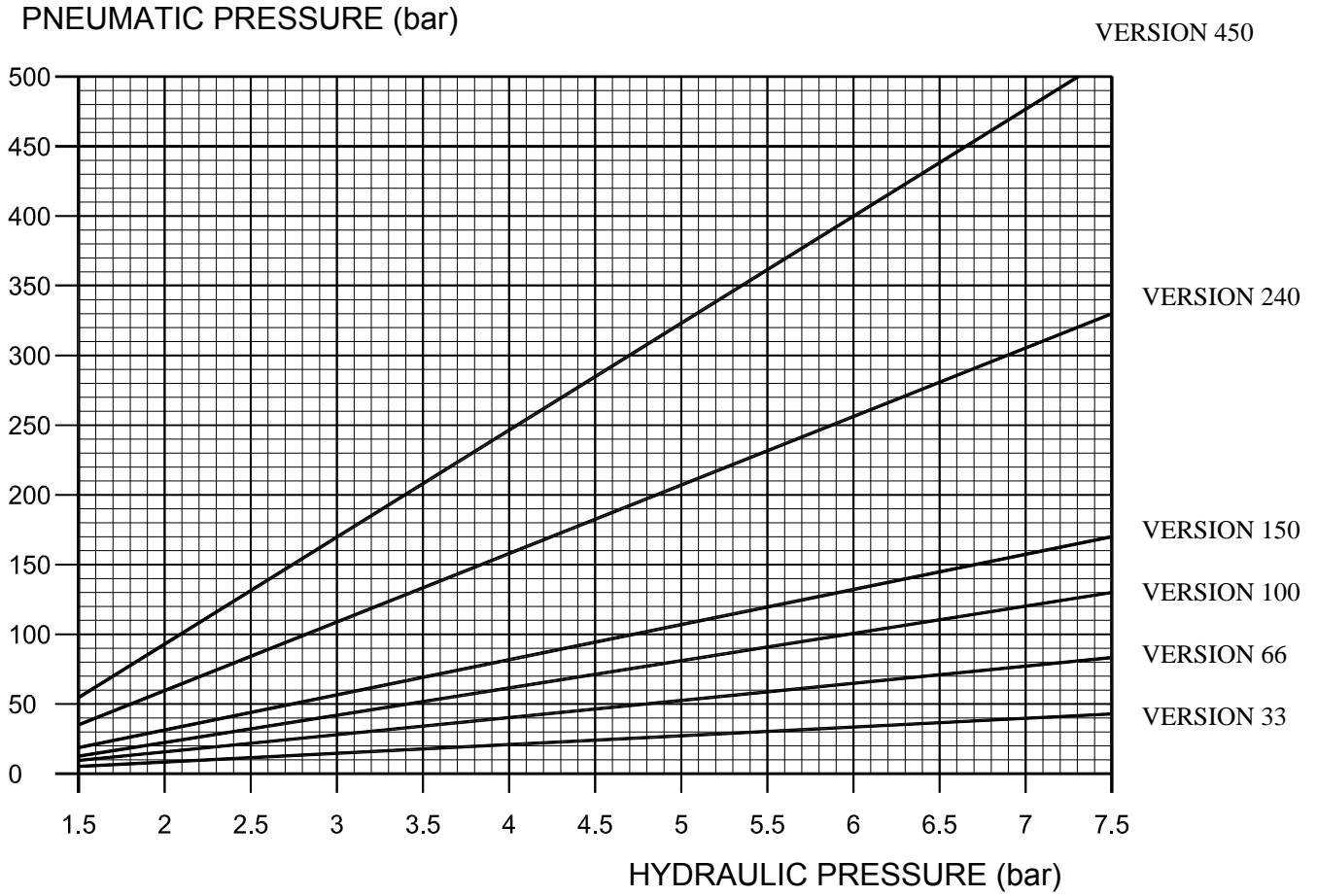


fig.7

Figure 7 shows the graph of air-oil compression ratios for the six versions of hydropneumatic pumps designed for hydropneumatic power units **5-1563**-*-*.

Order codes

The table below indicates the order code for a manual-control hydropneumatic power unit (maximum operating pressure: 450 bar), provided with semi-transparent nylon tank (standard version)

A	B	C
5-1563-	450	P

Field "A" specifies the type of device: **5-1563 = HYDROPNEUMATIC POWER UNIT**

Field "B" indicates the type of pump: **33 = ACHIEVABLE PRESSURE 33 bar (PUMP 1-1396-F)**

66 = ACHIEVABLE PRESSURE 60 bar (PUMP 1-1396-E)

100 = ACHIEVABLE PRESSURE 100 bar (PUMP 1-1396-D)

150 = ACHIEVABLE PRESSURE 150 bar (PUMP 1-1396-C)

210 = ACHIEVABLE PRESSURE 210 bar (PUMP 1-1396-B)

450 = ACHIEVABLE PRESSURE 450 bar (PUMP 1-1396-A)

Field "C" indicates the type of tank: **P = NYLON TANK (STANDARD)**

A = ALUMINIUM TANK (SPECIAL)

The code resulting from the example specified above is: **5-1563-450-P**.

Please specify in the order also the number and code of the modular blocks mounted on the power unit (max. 6). For the codes and characteristics of the above mentioned blocks see the relevant documents.

Possible failures during start-up

EFFECT		The power unit does not start
CAUSE	1	The power unit's pressure reducer is set to 0 bar
	2	The compressed air line is closed or clogged
REMEDY	1	Screw the pressure reducer's knob clockwise
	2	Check the compressed air line upstream of the power unit

EFFECT		The power unit functions slowly
CAUSE	1	The pressure reducer connected to the power unit is calibrated at less than 1.5 bar
	2	A pressure reducer calibrated at less than 2 bar is positioned upstream of the power unit
	3	There's a choke on the line upstream of the power unit (e.g. bent or crushed pipe)□
	4	The control unit has reached the balance pressure between incoming pneumatic pressure and delivered hydraulic pressure
REMEDY	1	Bring the reducer to a pressure above 2 bar
	2	Bring the reducer to a pressure above 2 bar
	3	Check the power unit's pneumatic duct
	4	Normal phenomenon

EFFECT		The power unit functions normally but there is no hydraulic flowrate
CAUSE	1	The oil level in the tank is insufficient
	2	The pump is off
	3	The suction filter is clogged
REMEDY	1	Pour some oil into the tank, and then start-up
	2	Start-up as indicated above
	3	Disassemble the power unit cover from the tank, unscrew filter from the suction union and clean thoroughly; re-assemble the unit and carry out the drainage procedure, if necessary

EFFECT		The pressure in the circuit is insufficient/the power unit is pumping continuously
CAUSE	1	Leak in the hydraulic circuit
REMEDY	1	Carefully inspect the hydraulic circuit and, if necessary, tighten again or replace the unions or the pieces with leaks of hydraulic fluid

Spare parts of power unit 5-1563-*-*

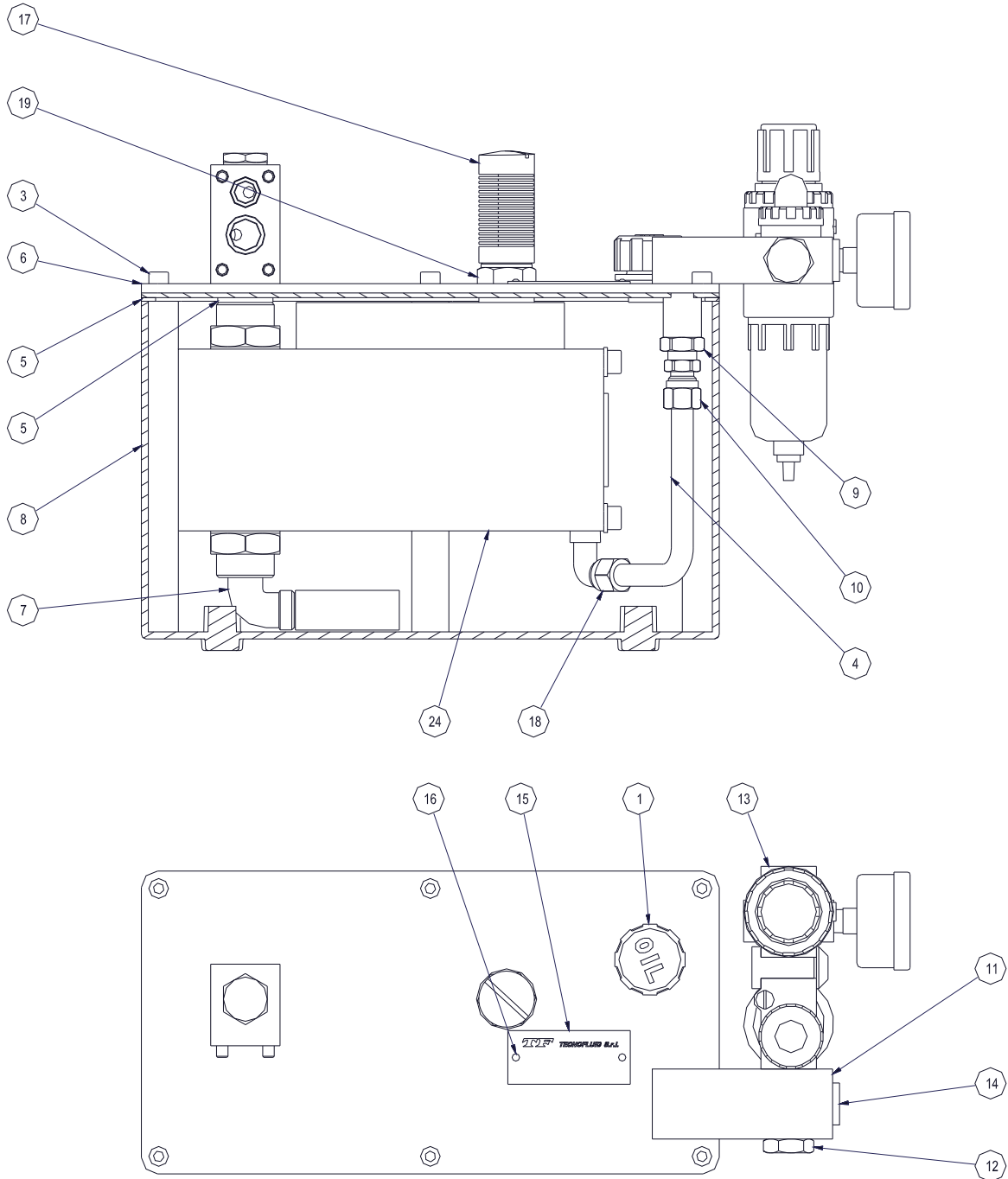


fig.8

Figure 8 shows an exploded view of power unit 5-1563-*-* , where all its components are numbered. The spare parts' list also includes the quantities of the items required for completing a single unit. For the list, see page 11.

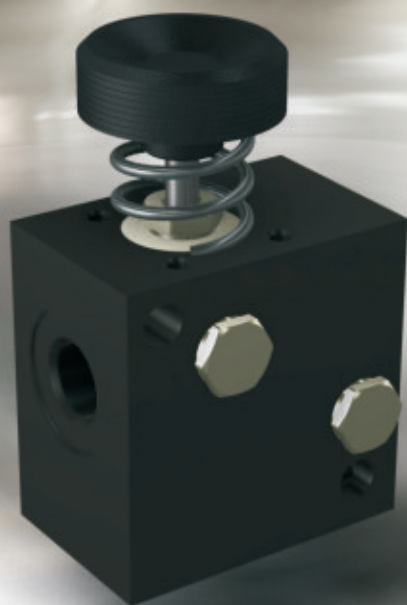
Spare parts' list for power unit 5-1563-*-* (see the exploded view in figure 8)

POS	NAME	Q.TY	ORDER CODE
1	FILL CAP 1/2"G. SPLASH GUARD	1	TCAR 12 30 P
2	PLASTIC CAP WITH STOP 3/8"	1	TCBP 38 G
3	HEX. SOCKET HEAD SCREW M5x16 UNI 5931	6	VTCE 5 16
4	NATURAL SMOOTH RILSAN PIPE 6-8	1	TU PN 8 6 LN
5	PAPER SEAL FOR TANK 3 P	1	GCA 1
6	COVER	1	5-1399-1
7	SUCTION FILTER 3/8" G.	1	5-1522-0
8	NYLON/ALUMINIUM TANK (3 LITRES)	1	SERB 3 P / 3 A
9	PNEUM EXTENSION 1/4"G. Lg 35	1	PROL 14 35
10	PNEUMATIC FITTING WITH DIR 1/4 T8 OGIVA	1	RAPD 14 08 2
11	PNEUMATIC BLOCK	1	5-1399-4
12	LOCKING SCREW	1	5-1399-5
13	FILTER (REG+LUBR+MAN) 1/4"	1	FRL 14 P
14	PNEUM CAP 1/4+SEAL	1	TC 14 P
15	PUMP PLATE 1 1194	1	TARGH 1194
16	STEEL NAIL Ø1.9x5	2	CH A 1.9 5
17	DYNAMIC SILENCER 3/8" G.	1	SIL 38 D
18	PNEUMATIC FITTING WITH RUB 1/4 T8 OGIVA	1	RAPG 14 08 2
19	PNEUM EXTENSION 3/8" Lg 23.5	1	PROL 38 23.5
20	ROND BONDED 3/8 Sp. 2.1	2	RTMG 38 1
21	ADAPTER	1	2-1398-7
22	OR 3062 15.54x2.62 NBR 70	1	PARK 2-114
23	OR 3050 12.37x2.62 NBR 70	2	PARK 2-112
24	HYDROPNEUMATIC PUMP	1	1-1396-* -0
25	MANIFOLD/COLUMN UNIT	1	5-1563-1

NOTES

THE HYDROPNEUMATIC POWER UNITS DESCRIBED IN THIS FILE HAVE BEEN DESIGNED AND MANUFACTURED ACCORDING TO CRITERIA AIMED AT PREVENTING ANY DAMAGE TO PEOPLE AND PROPERTY; ANYWAY, SINCE THESE HYDROPNEUMATIC POWER UNITS ARE PRESSURE GENERATORS, ANY IMPROPER USE OF THIS DEVICE MAY BE POTENTIALLY DANGEROUS.

THREE-WAY MANUAL CONTROL HYDRAULIC BLOCK



Requirements

This system consists of a three-way hydraulic distribution block (2-1398-0). This device has been designed to control the hydraulic pressure delivered by hydraulic power units (5-1563-*0). Therefore, a 5-1563 power unit is required to use the three-way distribution block (2-1398-0). For their technical characteristics, see the relevant technical documentation. This device has been designed to control a single pressure line, and therefore is fit for single-acting cylinders.

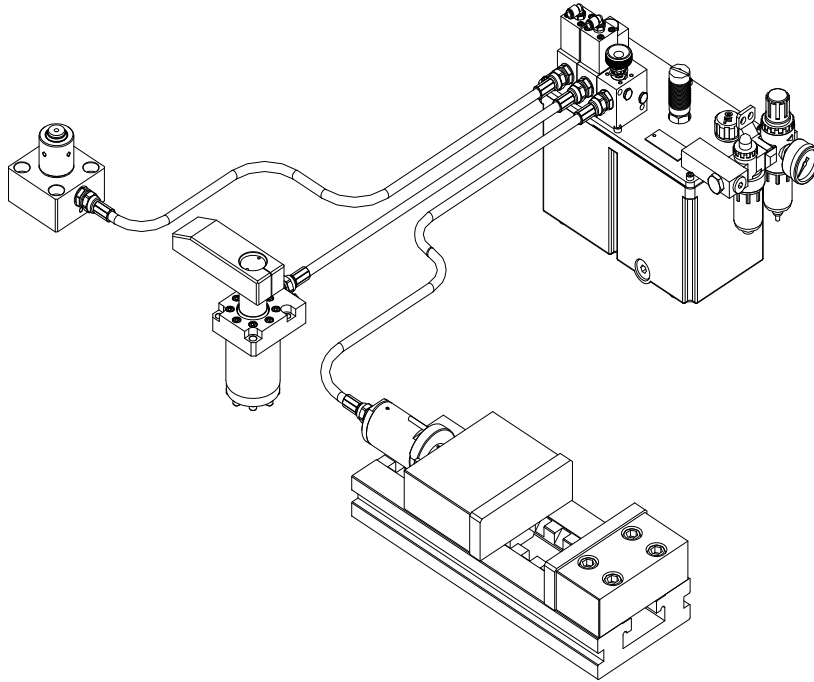


fig.1

Characteristics

Owing to its structural characteristics this system ensures the control of a hydraulic line and makes it possible to hold pressure even when the pressure in the rest of the system is lower, because oil is needed by another application. The system modularity also makes it possible to handle more pressure lines (up to a maximum of 6 elements).

Hydraulic system

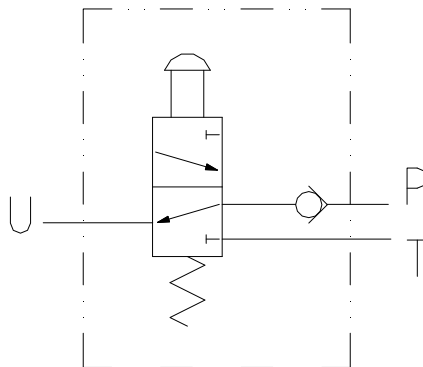


fig.2

Figure 2 shows the block's hydraulic diagram (2-1398-0) in the spring return version. The basic version is under examination: the block is mounted directly on the pressure intake flange of the hydraulic power unit. An additional modular version can be mounted on this basic block. The additional block's code is 2-1406-0. The symbols used in figure 2 shall be interpreted as follows:
P = Pressure line (from the power unit), **T** = Discharge line (to the power unit), **U** = connection to the hydraulic device.

Operating principle

This distributor exploits the motion of a distribution box that slides along its guide sleeve and covers/uncovers the openings which connect the delivery, use and discharge lines. A unidirectional valve is positioned upstream of this distribution box, to prevent pressure on the operating line from reaching the delivery line, if the pressure in this line is lower than the one in the pressure line, when hydraulic pressure is needed by another hydraulic block mounted on the plant.

Hydraulic diagrams

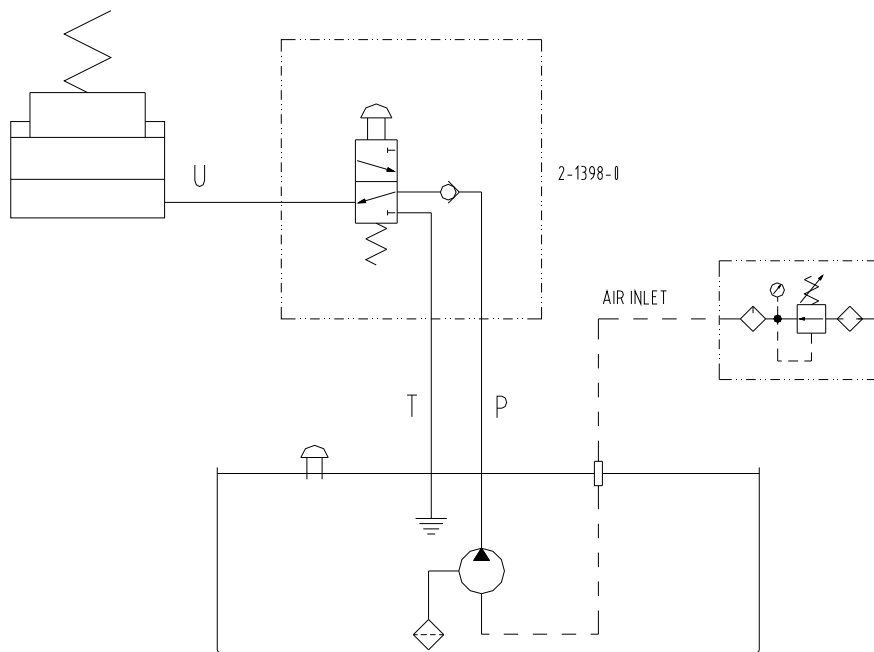


fig.3

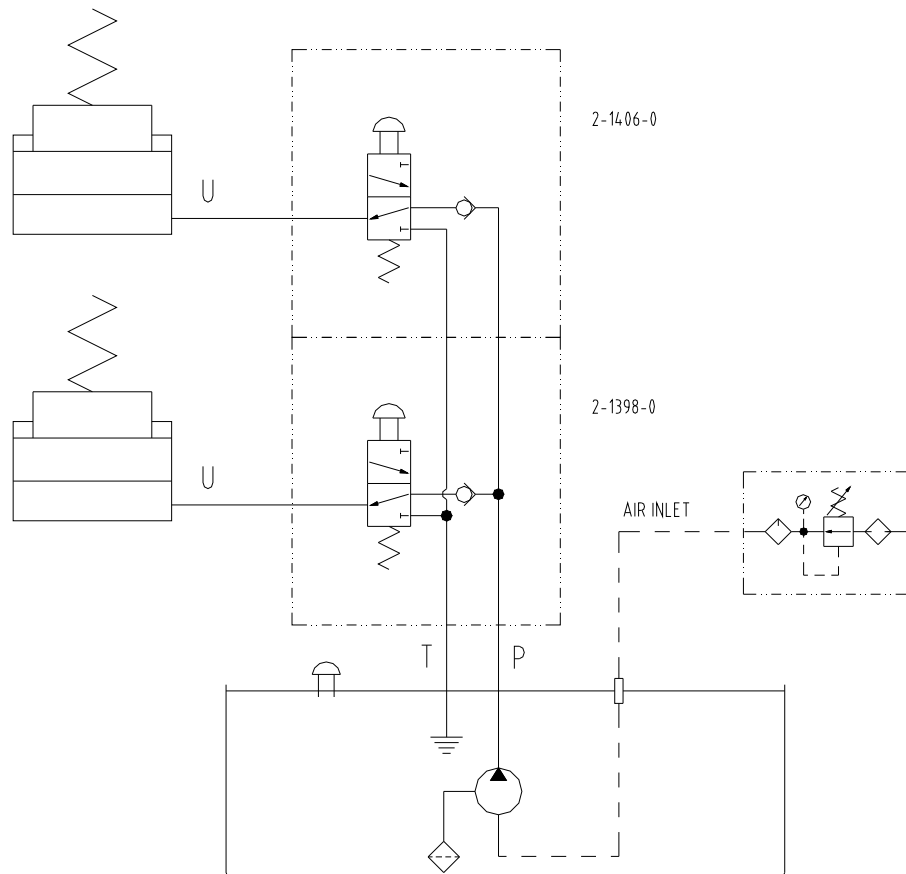


fig.4

Operation of single-use plant (diagram in figure 3)

The system shown in the figure is an example of connection of a single collector block (2-1398-0) to a hydropneumatic power unit.

In this case the block is connected to a single-acting spring-return cylinder.

In this position the power unit's delivery line is in communication with the cylinder, that is extended and under pressure. When pressing the manual control of block 2-1398-0, the delivery line is shut-off and the operating line connected to the cylinder is connected to the discharge.

When the button is released, block 2-1398-0 is switched again and the operating line is put under pressure.

Operation of single-use plant (diagram in figure 4)

The system shown in the figure is an example of connection of a collector block (2-1398-0) to an additional block (2-1406-0).

As in the above example, the cylinders connected to delivery lines are usually under pressure.

If the line of the cylinder connected to block 2-1406-0 is switched to the discharge mode, the pressure on the plant's delivery **P** will not change and the other block (2-1398-0) will remain under pressure. When the button of the block (2-1406-0) is released, the connected cylinder will need some fluid, and a pressure drop will occur on the whole pressure line **P** of the plant. The pressure in the cylinder connected to collector block 2-1398-0 will not drop suddenly, owing to the activation of the internal check valve.

Manual collector block 2-1398-0

This direct-actuation spring-return directional valve is operated when a stem slides vertically inside the seat available in the single-block distributor body. The stem motion is controlled by a push-button integral with the stem.

The valve body is made of steel coated with anti-friction material and passivized to withstand corrosion over the time.

Gaskets are usually made of nitrile rubber, but different compounds can be mounted when necessary.

The cursor and the internal unidirectional valve are made of treated and ground chrome-nickel steel.

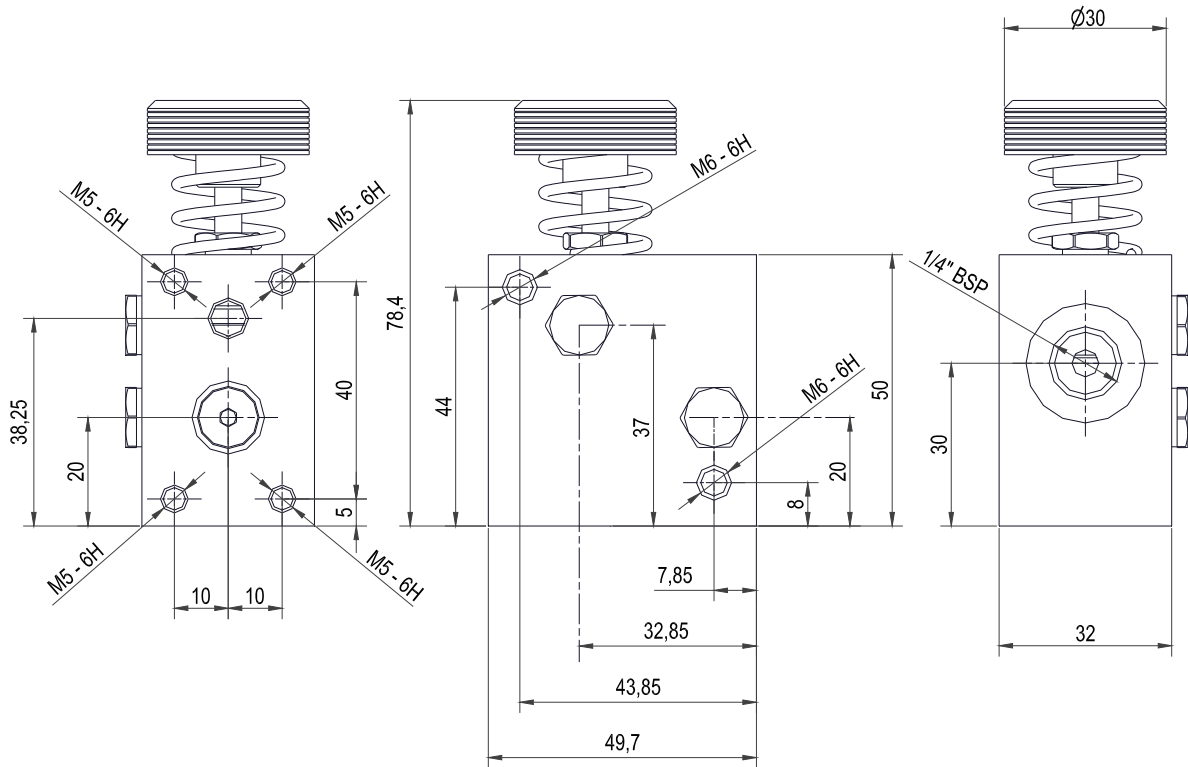


fig.5

Figure 5 shows the external view of collector block **2-1398-0**, with its overall dimensions. The device is secured to the power unit by means of 4 tapped holes (M5). The additional version **2-1406-0** is different from the basic version, but only because the two M6 holes are replaced by 2 through holes ($\varnothing 6.5$) for 2 M6 screws, that will clamp the additional distributor unit **2-1406-0** (max. 5 blocks) to collector block **2-1398-0**.

Technical data

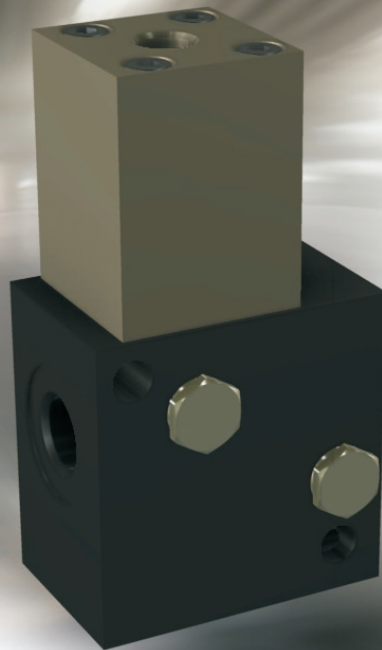
MAXIMUM WORKING PRESSURE	500 bar
MAXIMUM OIL VISCOSITY	10° Engler
MAXIMUM OIL TEMPERATURE	90°C
AMBIENT TEMPERATURE	-10 / +50°C
CONNECTION DIAMETER	1/4" G

NOTES

As specified above, distributor blocks **2-1398-0** and **2-1406-0** have been designed and manufactured for Tecnofluid hydropneumatic power units.

Any other application shall be carefully assessed in cooperation with our technical department.

THREE-WAY PNEUMATIC CONTROL HYDRAULIC BLOCK



Requirements

This system consists of a three-way hydraulic distribution block (2-1403-0).

This device has been designed to control the hydraulic pressure delivered by hydraulic power units (5-1563*-0). Therefore, a 5-1563 power unit is required to use the three-way distribution block (2-1403-0). For their technical characteristics, see the relevant technical documentation.

This device has been designed to control a single pressure line, and therefore is fit for single-acting cylinders. For cylinders or other devices to be actuated which require a double-acting control, use 2 distributor blocks: one for each line of the item to be actuated.

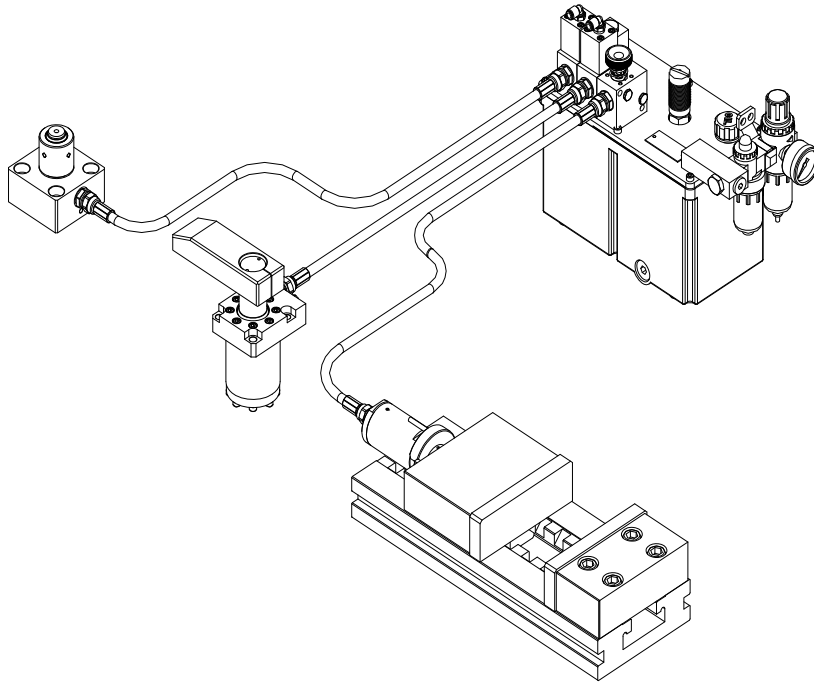


fig.1

Characteristics

Owing to its structural characteristics this system ensures the control of a hydraulic line and makes it possible to hold pressure even when the pressure in the rest of the system is lower, because oil is needed by another application. The system modularity also makes it possible to handle more pressure lines (up to a maximum of 6 elements).

Hydraulic diagram

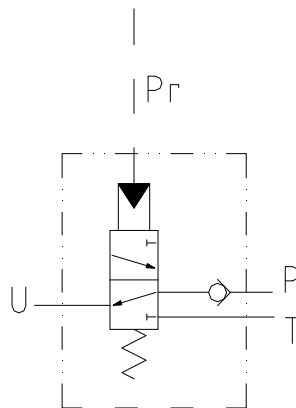


fig.2

Figure 2 shows the hydraulic diagram of block **2-1403-0**.

The basic version is under examination: the block is mounted directly on the pressure intake flange of the hydraulic power unit. An additional modular version can be mounted on this basic block. The additional block's code is **2-1405-0**.

The symbols used in figure 2 shall be interpreted as follows:

P = Pressure line (from the power unit), **T** = Discharge line (to the power unit), **U** = connection to the hydraulic device, **Pr** = Pneumatic driving line (from a 3-way pneumatic directional valve)

Operating principle

This distributor exploits the motion of a distribution box that slides along its guide sleeve and covers/uncovers the openings which connect the delivery, use and discharge lines. A unidirectional valve is positioned upstream of this distribution box, to prevent pressure on the operating line from reaching the delivery line, if the pressure in this line is lower than the one in the pressure line, when hydraulic pressure is need by another hydraulic block mounted on the plant.

Hydraulic connection diagrams

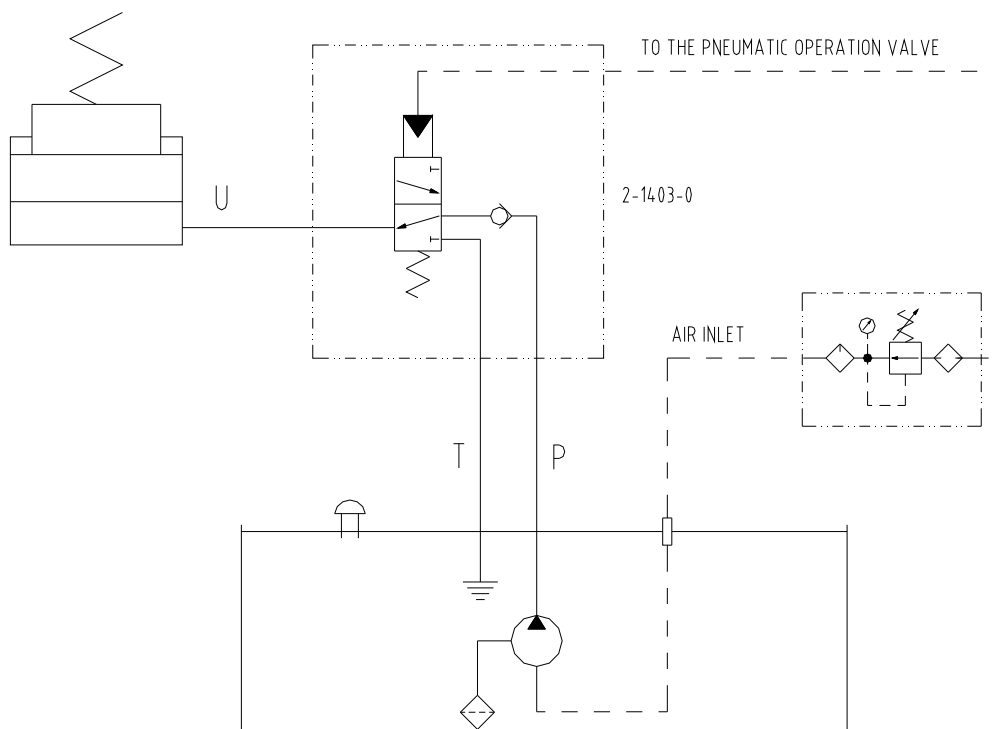


fig.3

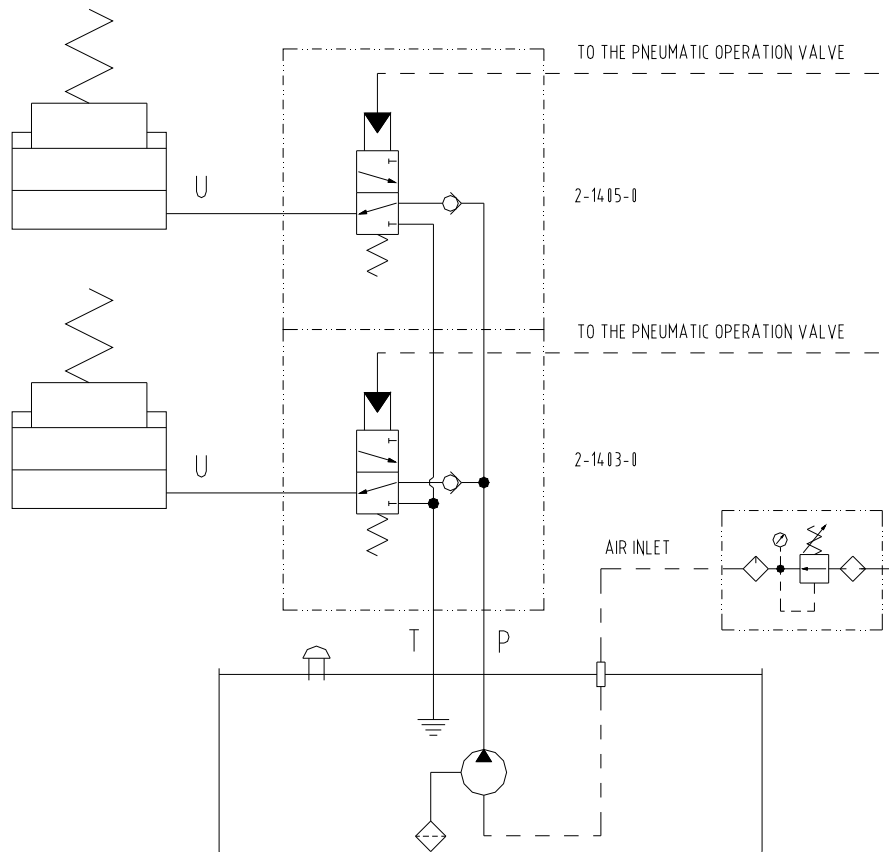


fig.4

Operation of a single-use plant (diagram in figure 3)

The system shown in the figure is an example of connection of a single collector block (2-1403-0) to a hydropneumatic power unit.

In this case the block is connected to a single-acting spring-return cylinder.

In this position the power unit's delivery line is in communication with the cylinder, that is extended and under pressure. By providing pressure to the pneumatic driving line of block 2-1403-0, the delivery line is shut-off and the line connected to the cylinder is connected to the discharge.

By letting the pressure on the pneumatic driving line out, block 2-1403-0 is switched again and puts the operating line under pressure again.

Operation of a double-use plant (diagram in figure 4)

The system shown in the figure is an example of connection of a collector block (2-1403-0) to an additional block (2-1405-0).

As in the above example, the cylinders connected to delivery lines are usually under pressure.

If the line of the cylinder connected to block 2-1405-0 is switched to the discharge mode, the pressure on the plant's delivery P will not change and the other block (2-1403-0) will remain under pressure. By letting out the pressure on the pneumatic driving line of block 2-1405-0, the connected cylinder will need some fluid, and a pressure drop will occur on the whole pressure line P of the plant. The pressure in the cylinder connected to collector block 2-1403-0 will not drop suddenly, owing to the activation of the internal check valve.

Pneumatic collector block 2-1403-0

This pneumatic spring-return directional valve is operated when a stem slides vertically inside the seat available in the single-block distributor body. The stem is moved by a pneumatic piston integral with the stem.

The valve body is made of steel coated with anti-friction material and passivized to withstand corrosion over the time.

Gaskets are usually made of nitrile rubber, but different compounds can be mounted when necessary.

The cursor and the internal unidirectional valve are made of treated and ground chrome-nickel steel.

The liner of the pneumatic drive unit is made of hard oxidized aluminium, like the piston moving inside it, which is anodized only.

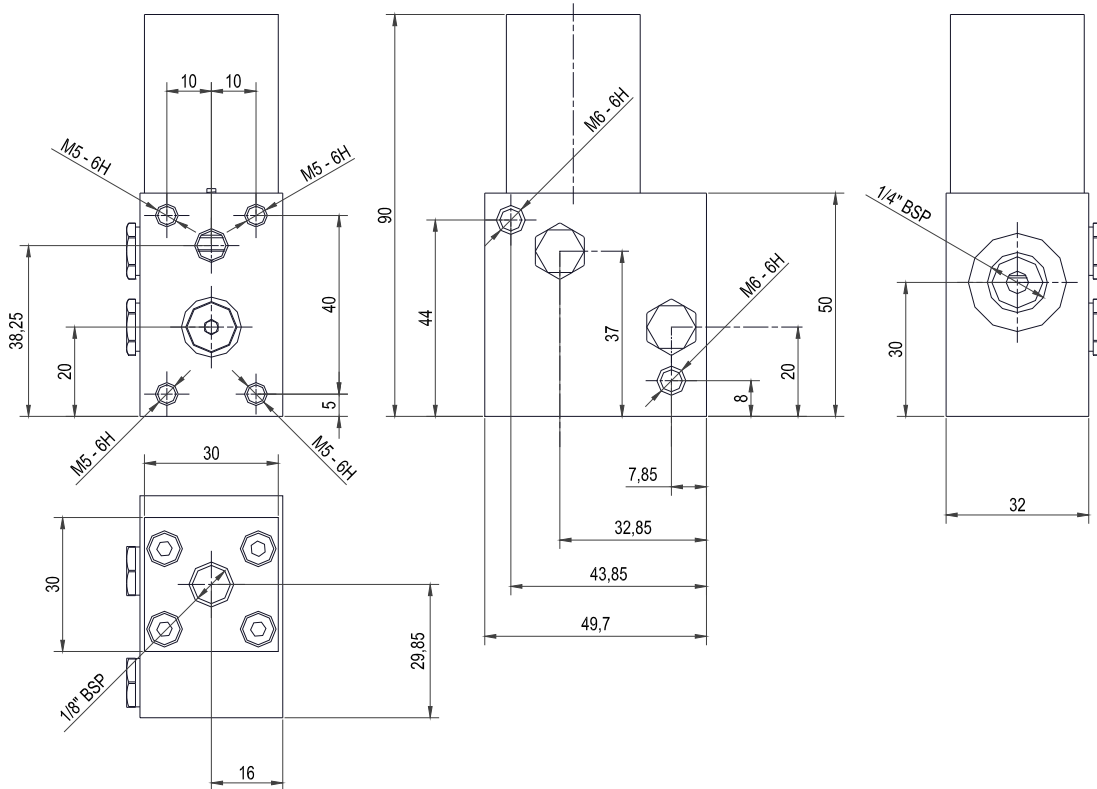


fig.5

Figure 5 shows the external view of collector block **2-1405-0**, with its overall dimensions. The device is secured to the power unit by means of 4 tapped holes (M5). The additional version **2-1405-0** is different from the basic version, but only because the two M6 holes are replaced by 2 through holes ($\varnothing 6.5$) for 2 M6 screws, that will clamp the additional distributor unit **2-1405-0** (max. 5 blocks) to collector block **2-1403-0**.

Technical data

MAXIMUM WORKING PRESSURE	500 bar
MAXIMUM PNEUMATIC DRIVE PRESSURE	7 bar
MAXIMUM OIL VISCOSITY	10° Engler
MAXIMUM OIL TEMPERATURE	90°C
AMBIENT TEMPERATURE	-10 +50°C
CONNECTION DIAMETER	1/4" G.
DRIVE CONNECTION DIAMETER	1/8" G.

NOTES

As specified above, distributor blocks **2-1403-0** and **2-1405-0** have been designed and manufactured for Tecnofluid hydropneumatic power units.

Any other application shall be carefully assessed in cooperation with our technical department.

THREE-WAY HYDRAULIC BLOCK MANUAL CONTROL AND DETENTOR



Requirements

This system consists of a three-way hydraulic distribution block (2-1634-0).

This device has been designed to control the hydraulic pressure delivered by hydraulic power units (5-1563*-0). Therefore, a 5-1563 power unit is required to use the three-way distribution block (2-1634-0). For their technical characteristics, see the relevant technical documentation.

This device has been designed to control a single pressure line, and therefore is fit for single-acting cylinders.

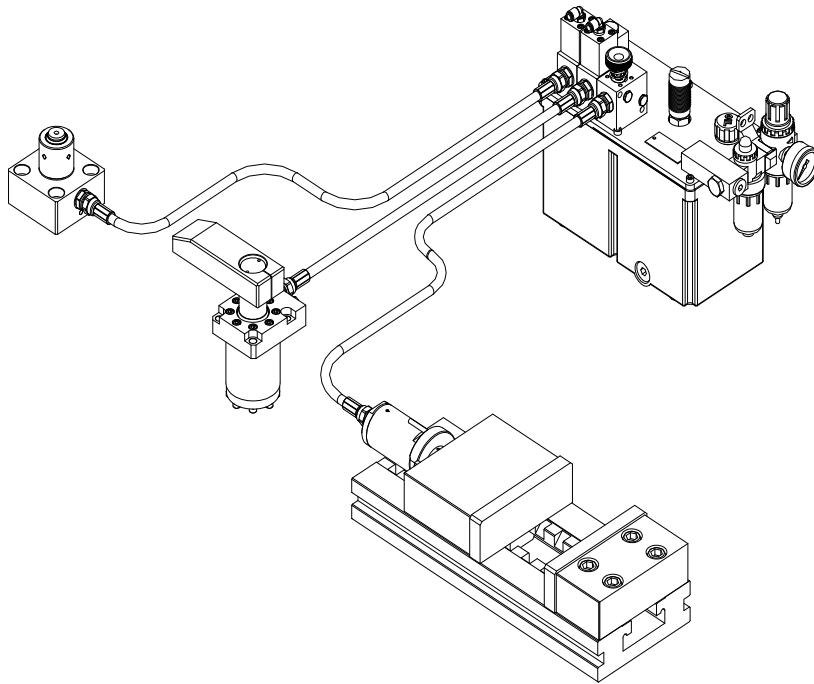


fig.1

Characteristics

Owing to its structural characteristics this system ensures the control of a hydraulic line and makes it possible to hold pressure even when the pressure in the rest of the system is lower, because oil is needed by another application. The system modularity also makes it possible to handle more pressure lines (up to a maximum of 6 elements).

Hydraulic diagram

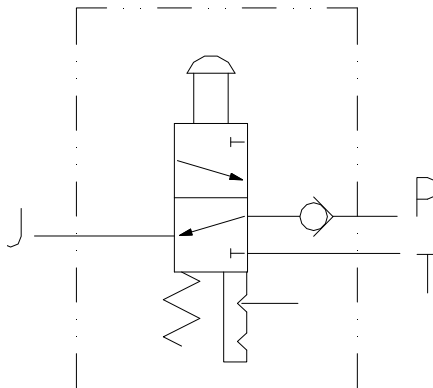


fig.2

Figure 2 shows the hydraulic diagram of block **2-1634-0**.

The basic version is under examination: the block is mounted directly on the pressure intake flange of the hydraulic power unit. An additional modular version can be mounted on this basic block. The additional block's code is **2-1635-0**.

The symbols used in figure 2 shall be interpreted as follows:

P = Pressure line (from the power unit), **T** = Discharge line (to the power unit), **U** = connection to the hydraulic device.

Operating principle

This distributor exploits the motion of a distribution box that slides along its guide sleeve and covers/uncovers the openings which connect the delivery, use and discharge lines. A unidirectional valve is positioned upstream of this distribution box, to prevent pressure on the operating line from reaching the delivery line, if the pressure in this line is lower than the one in the pressure line, when hydraulic pressure is need by another hydraulic block mounted on the plant.

Hydraulic connection diagrams

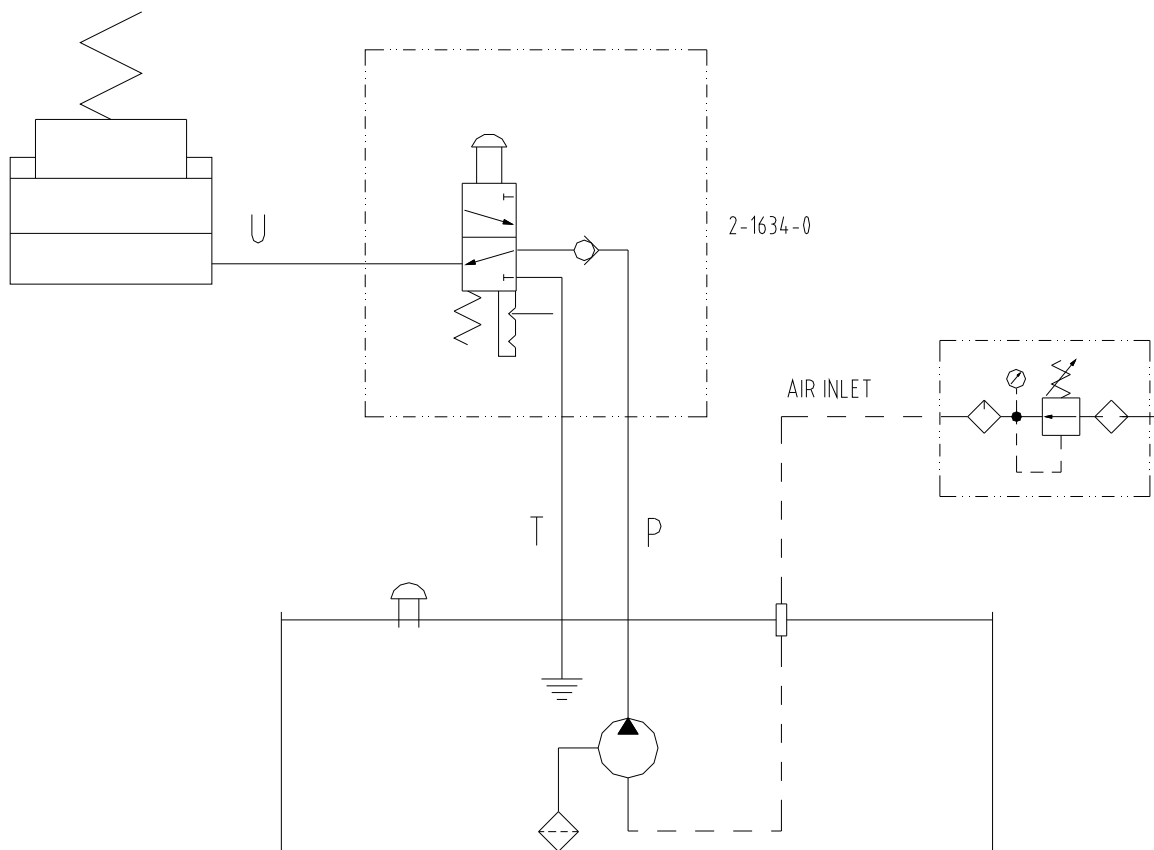


fig.3

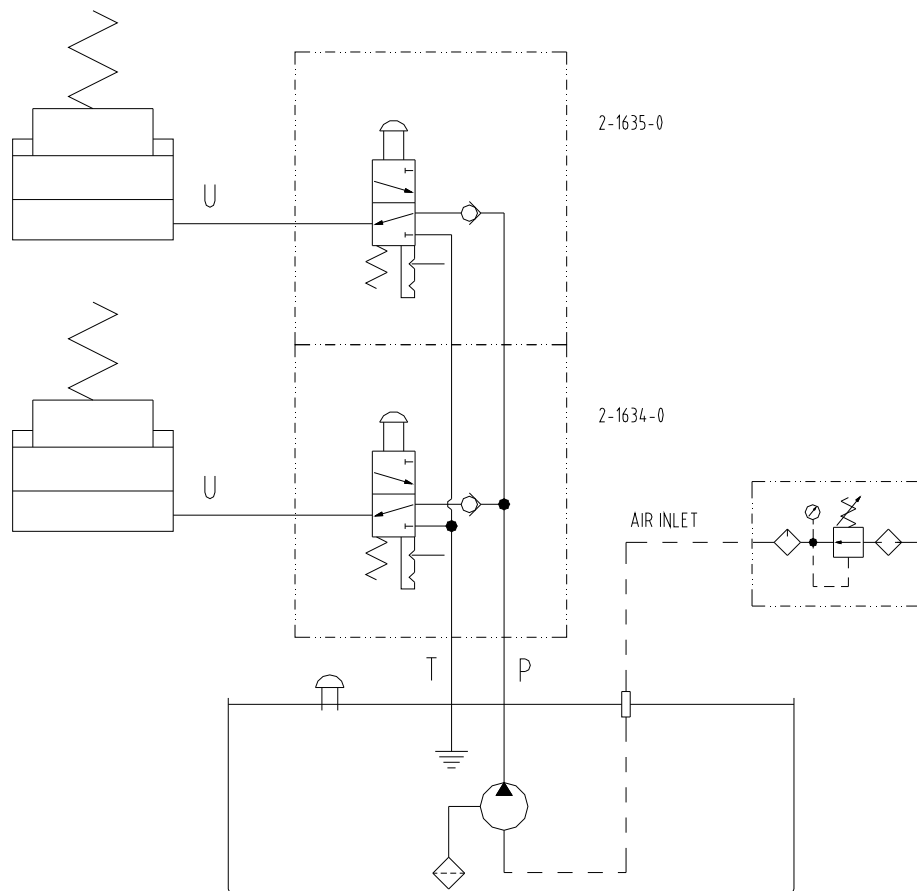


fig.4

Operation of a single-use plant (diagram in figure 3)

The system shown in the figure is an example of connection of a single collector block (2-1634-0) to a hydropneumatic power unit.

In this case the block is connected to a single-acting spring-return cylinder.

In this position the power unit's delivery line is in communication with the cylinder, that is extended and under pressure. By pressing and turning (to keep it pressed) the manual control of block 2-1634-0, the delivery line is shut-off and the line connected to the cylinder is connected to the discharge.

When the manual control is turned in the opposite direction and the button is released, block 2-1634-0 is switched again and the operating line is put under pressure.

Operation of a single-use plant (diagram in figure 4)

The system shown in the figure is an example of connection of a collector block (2-1634-0) to an additional block (2-1635-0).

As in the above example, the cylinders connected to delivery lines are usually under pressure.

If the line of the cylinder connected to block 2-1635-0 is switched to the discharge mode, the pressure on the plant's delivery P will not change and the other block (2-1634-0) will remain under pressure. When the button of block 2-1635-0 is turned and released, the connected cylinder will need some hydraulic fluid, and a pressure drop will occur on the whole pressure line P of the plant. The pressure in the cylinder connected to collector block 2-1634-0 will not drop suddenly, owing to the activation of the internal check valve.

Manual collector block 2-1634-0

This direct-actuation spring-return directional valve is operated when a stem slides vertically inside the seat available in the single-block distributor body. The stem motion is controlled by a push-button integral with the stem. The push-button is retained by means of a hollow grub screw inside which a pin integral with the piston stem slides.

The valve body is made of steel coated with anti-friction material and passivized to withstand corrosion over the time.

Gaskets are usually made of nitrile rubber, but different compounds can be mounted when necessary. The cursor and the internal unidirectional valve are made of treated and ground chrome-nickel steel.

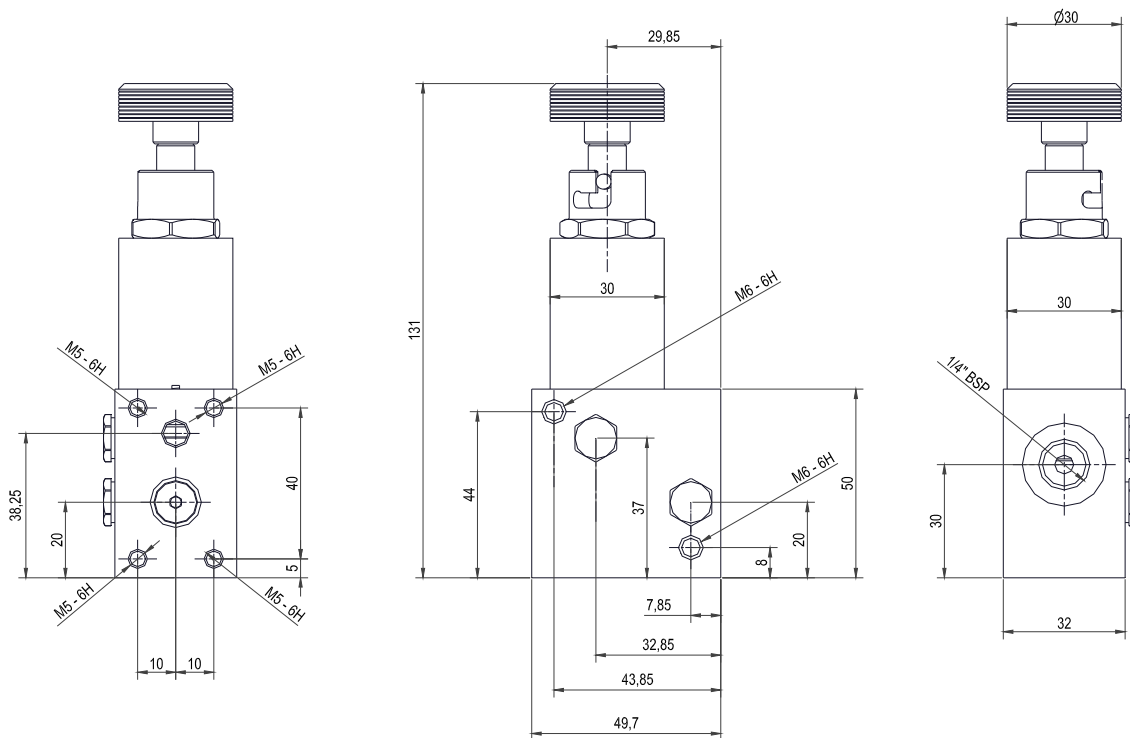


fig.5

Figure 5 shows the external view of collector block **2-1634-0**, with its overall dimensions. The device is secured to the power unit by means of 4 tapped holes (M5). The additional version **2-1635-0** is different from the basic version, but only because the two M6 holes are replaced by 2 through holes ($\varnothing 6.5$) for 2 M6 screws, that will clamp the additional distributor unit **2-1635-0** (max. 5 blocks) to collector block **2-1634-0**.

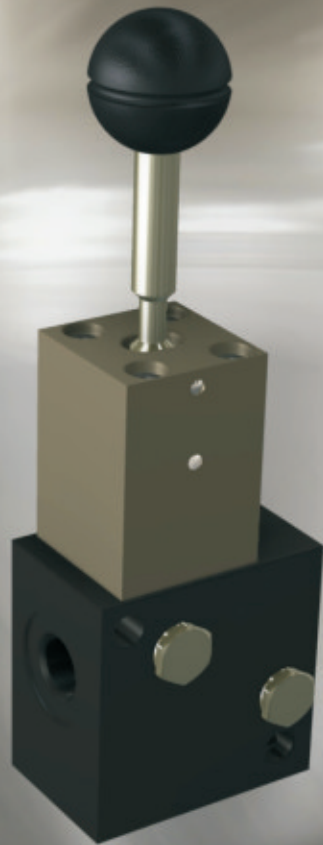
Technical data

MAXIMUM WORKING PRESSURE	500 bar
MAXIMUM OIL VISCOSITY	10° Engler
MAXIMUM OIL TEMPERATURE	90°C
AMBIENT TEMPERATURE	-10 +50°C
CONNECTION DIAMETER	1/4" G.

NOTES

As specified above, distributor blocks **2-1634-0** and **2-1635-0** have been designed and manufactured for Tecnofluid hydropneumatic power units.
Any other application shall be carefully assessed in cooperation with our technical department.

THREE-WAY LEVER CONTROL HYDRAULIC BLOCK



Requirements

This system consists of a three-way hydraulic distribution block (2-1514-0).

This device has been designed to control the hydraulic pressure delivered by hydraulic power units (5-1563*-0). Therefore, a 5-1563 power unit is required to use the three-way distribution block (2-1514-0). For their technical characteristics, see the relevant technical documentation.

This device has been designed to control a single pressure line, and therefore is fit for single-acting cylinders. For cylinders or other devices to be actuated which require a double-acting control, use 2 distributor blocks: one for each line of the item to be actuated.

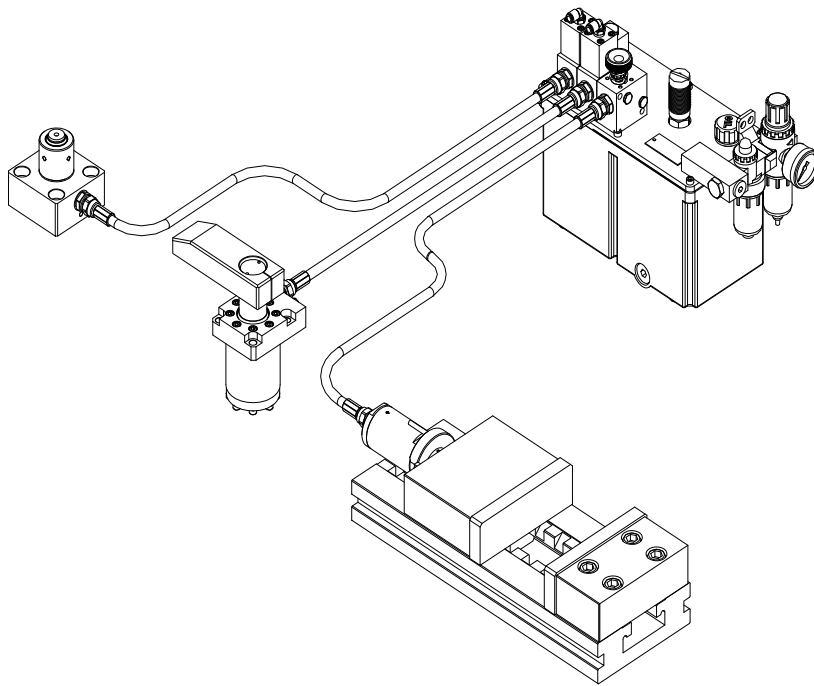


fig.1

Characteristics

Owing to its structural characteristics this system ensures the control of a hydraulic line and makes it possible to hold pressure even when the pressure in the rest of the system is lower, because oil is needed by another application. The system modularity also makes it possible to handle more pressure lines (up to a maximum of 6 elements).

Hydraulic diagram

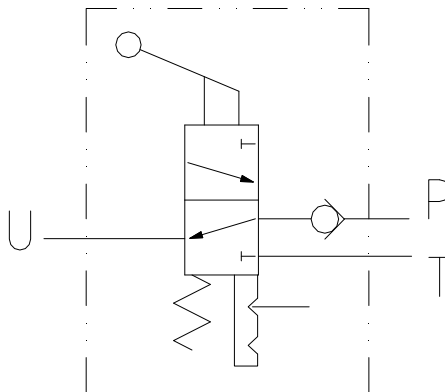


fig.2

Figure 2 shows the hydraulic diagram of block **2-1514-0**.

The basic version is under examination: the block is mounted directly on the pressure intake flange of the hydraulic power unit. An additional modular version can be mounted on this basic block. The additional block's code is **2-1514-A-0**.

The symbols used in figure 2 shall be interpreted as follows:

P = Pressure line (from the power unit), **T** = Discharge line (to the power unit), **U** = connection to the hydraulic device, **Pr** = Pneumatic driving line (from a 3-way pneumatic directional valve)

Operating principle

This distributor exploits the motion of a distribution box that slides along its guide sleeve and covers/uncovers the openings which connect the delivery, use and discharge lines. A unidirectional valve is positioned upstream of this distribution box, to prevent pressure on the operating line from reaching the delivery line, if the pressure in this line is lower than the one in the pressure line, when hydraulic pressure is need by another hydraulic block mounted on the plant.

Hydraulic connection diagrams

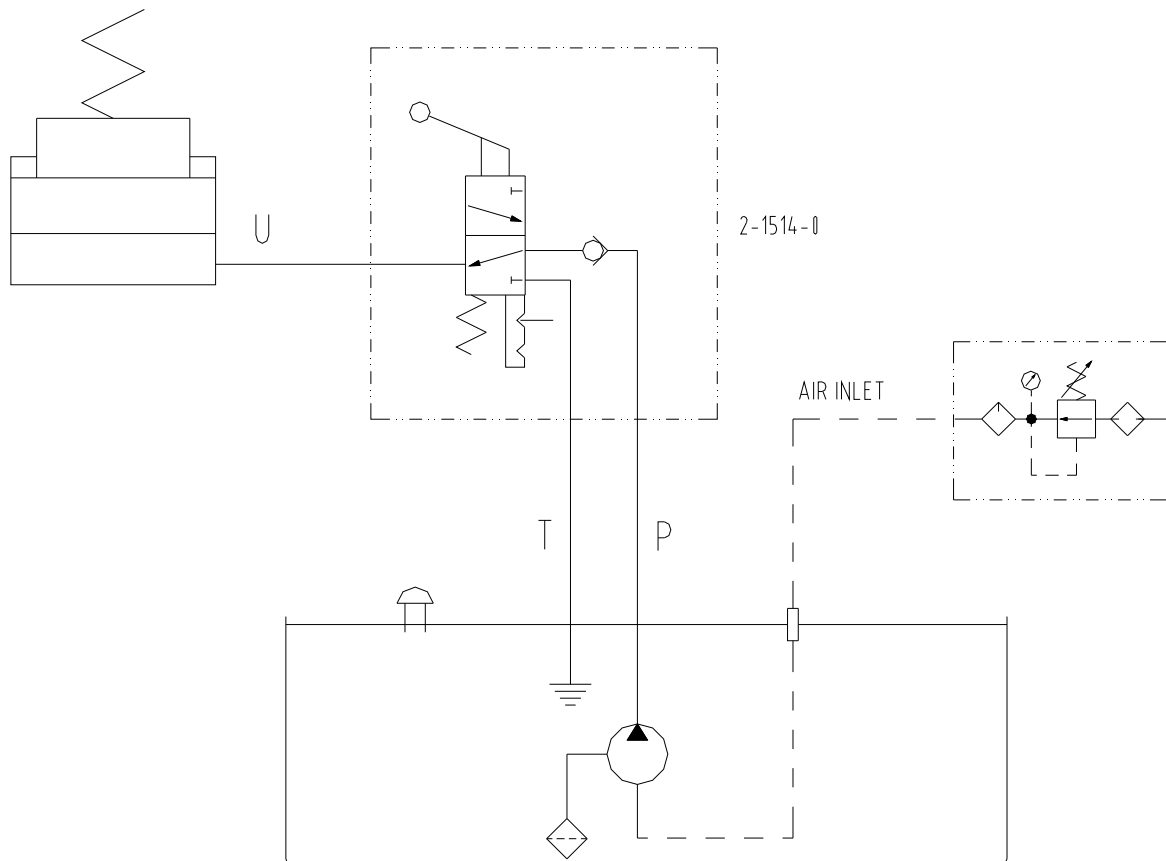


fig.3

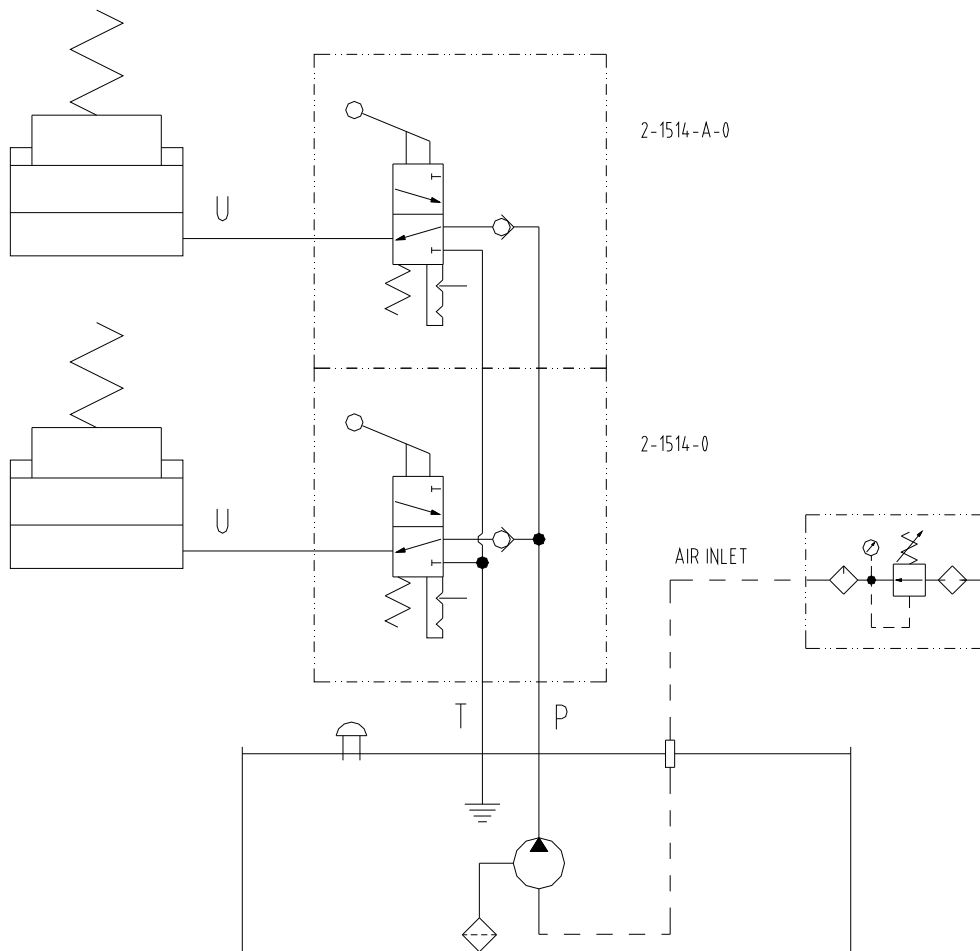


fig.4

Operation of a single-use plant (diagram in figure 3)

The system shown in the figure is an example of connection of a single collector block (2-1514-0) to a hydropneumatic power unit.

In this case the block is connected to a single-acting spring-return cylinder.

In this position the power unit's delivery line is in communication with the cylinder, that is extended and under pressure. By activating the lever control available on block 2-1514-0, the delivery line is shut-off and the line connected to the cylinder is connected to the discharge.

When the control lever is moved to the previous position, block 2-1514-0 is switched again and the operating line is put under pressure.

Operation of a double-use plant (diagram in figure 4)

The system shown in the figure is an example of connection of a collector block (2-1514-0) to an additional block (2-1514-A-0).

As in the above example, the cylinders connected to delivery lines are usually under pressure.

If the line of the cylinder connected to block 2-1514-0 is switched to the discharge mode, the pressure on the plant's delivery P will not change and the other block (2-1514-A-0) will remain under pressure. When the lever on block 2-1514-A-0 is moved, the connected cylinder will need some hydraulic fluid, and a pressure drop will occur on the whole pressure line P of the plant. The pressure in the cylinder connected to collector block 2-1514-0 will not drop suddenly, owing to the activation of the internal check valve.

Lever control collector block (code 2-1514-0)

This manual control (bistable lever) directional valve is operated when a stem slides vertically inside the seat available in the single-block distributor body. The stem motion is controlled by a cam which slides coaxially to the piston, actuated by the control lever.

The valve body is made of steel coated with anti-friction material and passivized to withstand corrosion over the time.

Gaskets are usually made of nitrile rubber, but different compounds can be mounted when necessary.

The cursor and the internal unidirectional valve are made of treated and ground chrome-nickel steel.

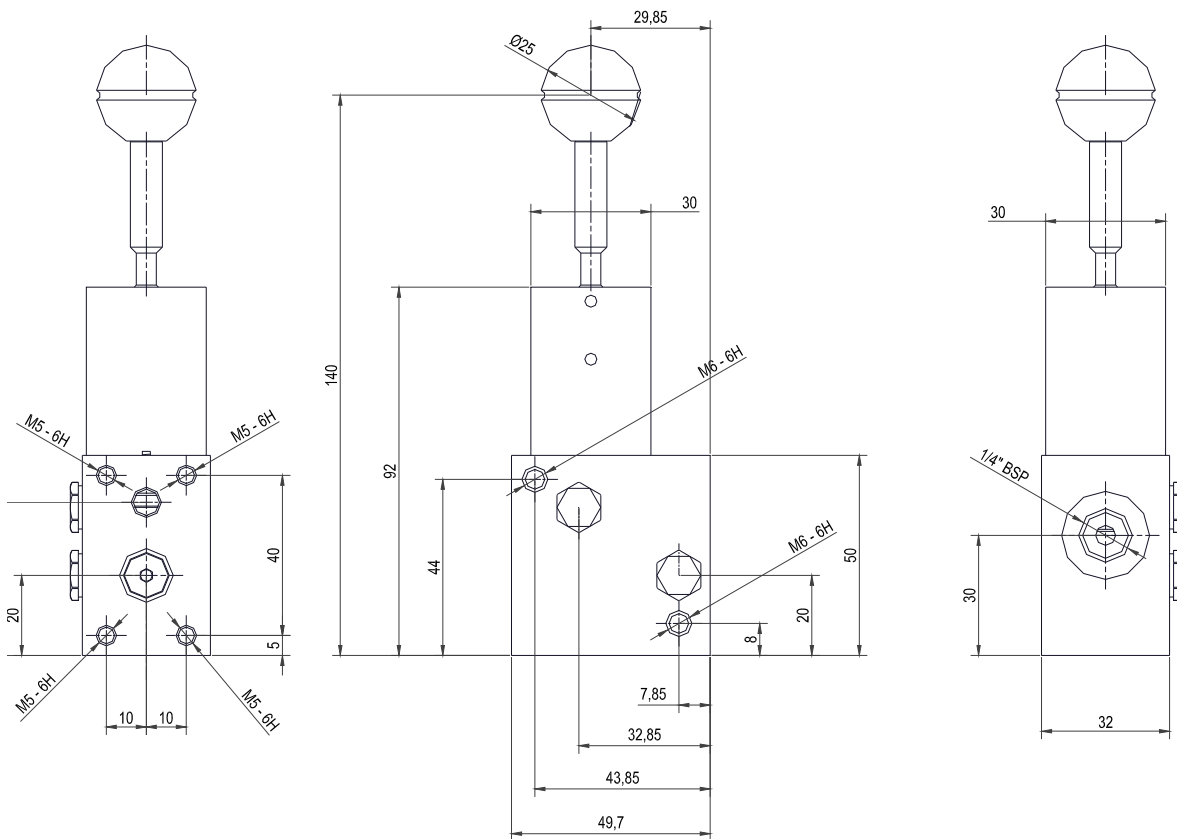


fig.5

Figure 5 shows the external view of collector block **2-1415-0**, with its overall dimensions. The device is secured to the power unit by means of 4 tapped holes (M5). The additional version **2-1415-A-0** is different from the basic version, but only because the two M6 holes are replaced by 2 through holes ($\varnothing 6.5$) for 2 M6 screws, that will clamp the additional distributor unit **2-1514-0** (max. 5 blocks) to collector block **2-1514-A-0**.

Technical data

MAXIMUM WORKING PRESSURE	500 bar
MAXIMUM OIL VISCOSITY	10° Engler
MAXIMUM OIL TEMPERATURE	90°C
AMBIENT TEMPERATURE	-10 +50°C
CONNECTION DIAMETER	1/4" G.

NOTES

As specified above, distributor blocks **2-1514-0** and **2-1514-A-0** have been designed and manufactured for Tecnofluid hydropneumatic power units.
Any other application shall be carefully assessed in cooperation with our technical department.