SP154X-008E-1
P TV

All air balancing system

Example of circuit diagram

* No need for electrical control, simple and low cost
* Available with standard air equipment
* Workload can be reduced drastically with a small operating force

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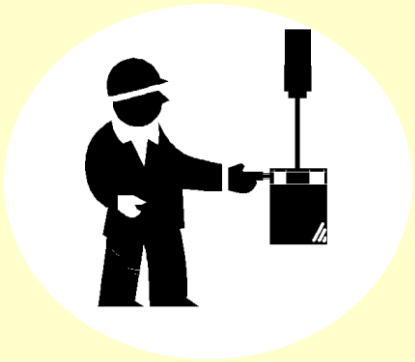
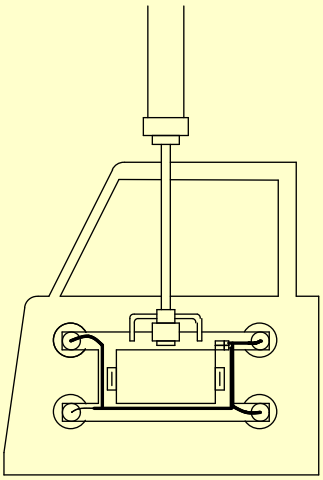
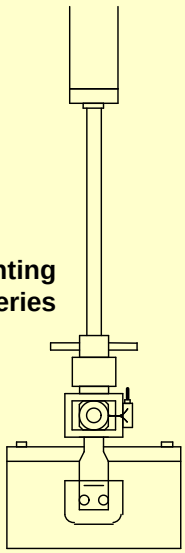
Application



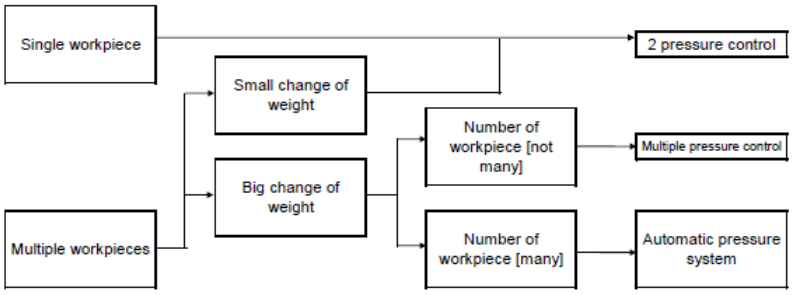
Mounting doors



Mounting batteries



Balance system features



2 pressure/Multiple pressure control
- Press the mechanical valve button to select load
- Fine adjustment of the operating force to match individual operators
- Applicable to various load weights

Automatic load sensor system
- Automatically balanced with a load sensor
- Handles multiple workpieces with a simple configuration
- The workpiece position is finely adjustable

Common specifications

Recommended weight of workpiece：40kg or under (safe value considering inertia)

Operation force： 30N or less

Max. operating pressure：0.6MPa（Balanced pressure 0.5MPa)

Fluid：Dried air（mist separator is necessary）

Ambient and fluid temperature：-5℃ to 60℃（No freezing）

Automatic pressure system specifications

Applicable bore size： φ50

Workpiece operation： Mounting a handle to the specified location

Adjustment of response sensitivity ：

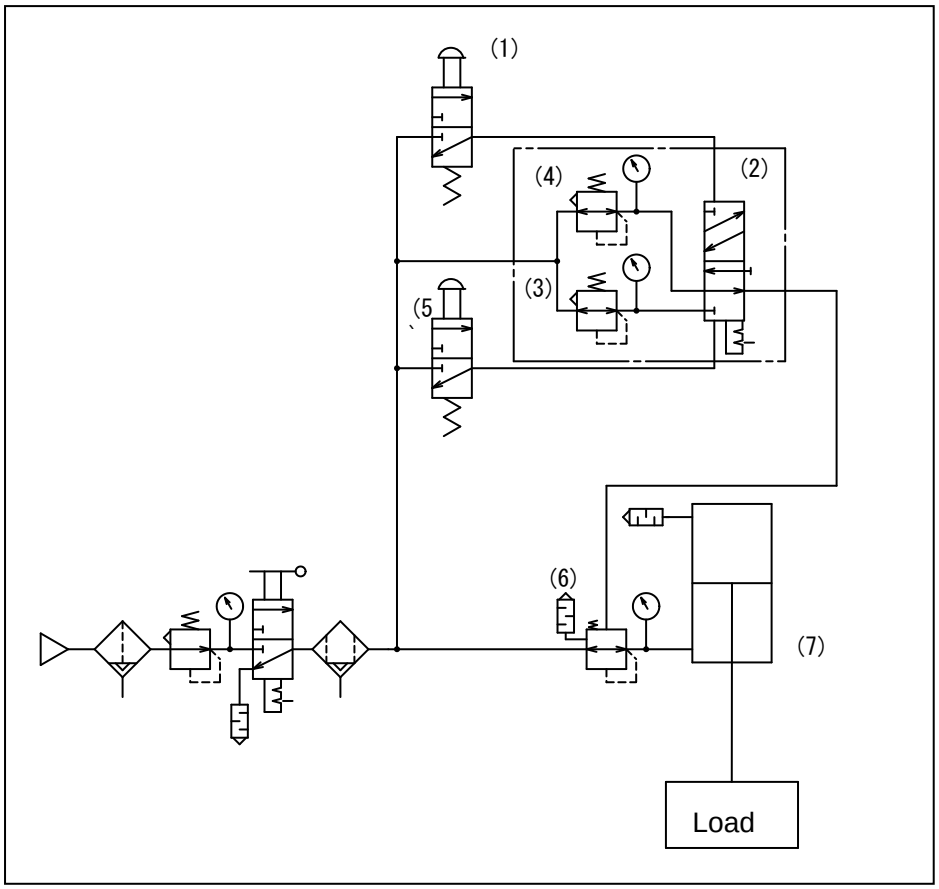
Adjustable with a throttle valve on the circuit

Warning If air pressure is released during balancing operation, the workpiece will fall suddenly. Please decide the original position at the lowered-end and prevent drop of workpiece break system of cylinder and measures on circuit if necessary.

If workpiece is removed, a cylinder goes up rapidly. Please design jigs considering prevention of dropping workpiece.

Single workpiece and balance selection: 2 pressures selecting circuit

This is a common manually balanced circuit. When a workpiece is changed, the pressure is changed and jig is used to be balanced.



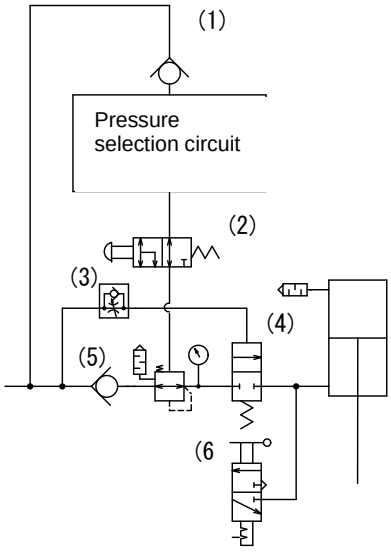
Example of component parts

(1)	Mechanical valve with button to balance workpiece VM130-01-33BA
(2)	Air operated valve for pressure selection VR4152-01A-1
(3)	Regulator for balancing workpiece AR30-02BG-B
(4)	Regulator for balancing jig ARP30-02BG
(5)	Mechanical valve with button to balance workpiece VM130-01-33BA
(6)	Air operated precision regulator IR412-02G
(7)	Cylinder MB*40-***

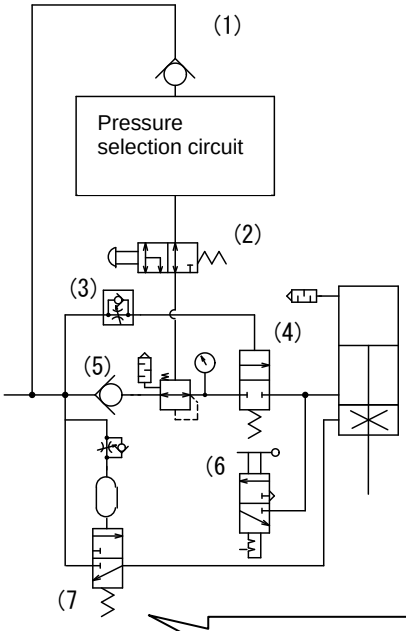
Example of drop prevention circuit

Drop of the workpiece is prevented by blocking the air supply line and pressure selection circuit (shown in a chain line above the circuit)

If pressure is turned off



If a cylinder with lock is used

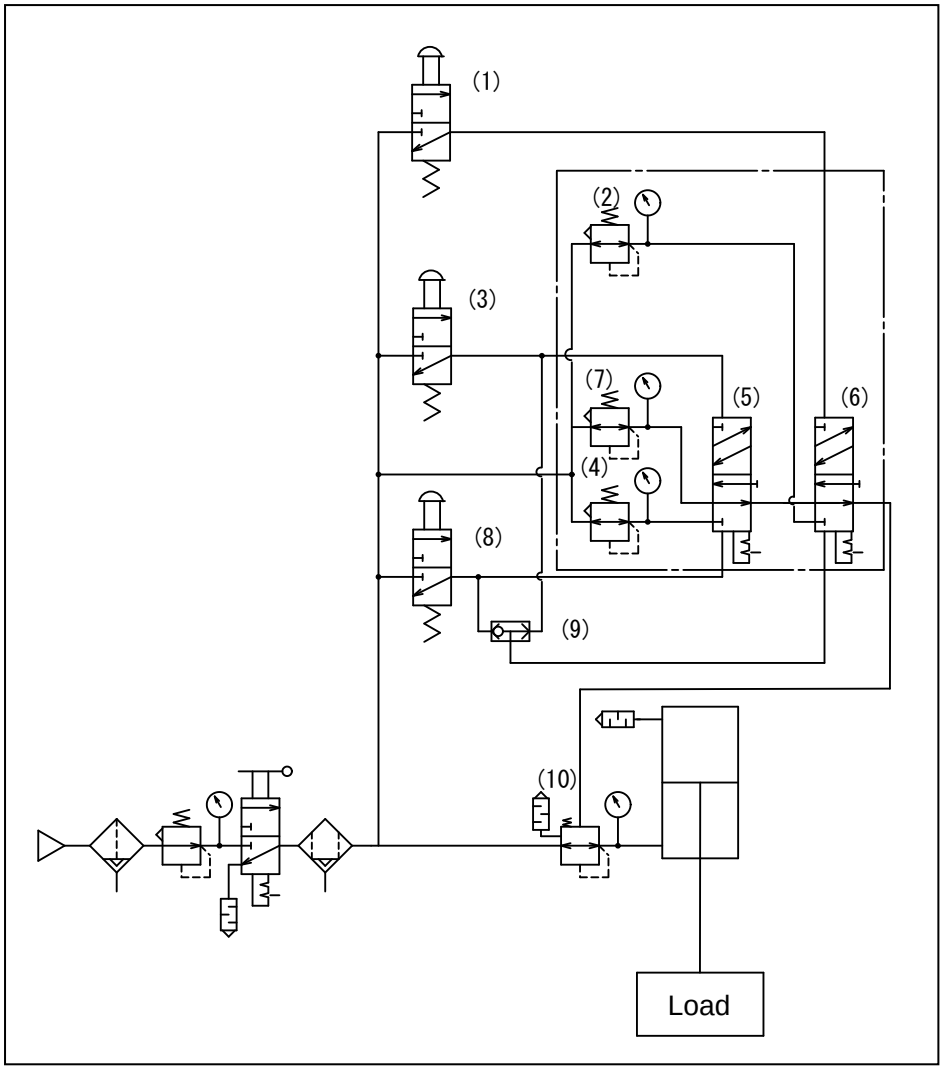


This is an air timer to delay release of the lock until the balancing pressure is stable.

(1)	Check valve for signal circuits
(2)	Residual pressure relief valve for signal circuits
(3)	For delayed supply Speed Controller
(4)	2 port valve for blocks
(5)	Check valve for signal circuits
(6)	Residual pressure release valve for cylinders
(7)	Timer for delaying unlocks

2 types of workpieces and balance jig: 3 pressure balance

When a multiple number of workpieces and weights are used, pressure variations are added.

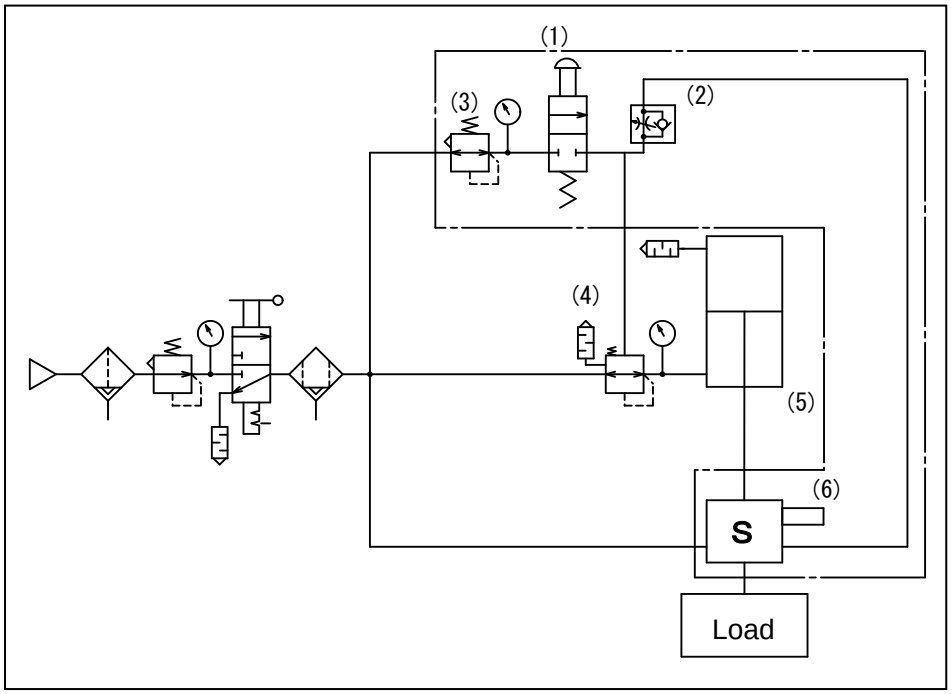


Example of component parts

(1)	Mechanical valve with button to balance jig VM130-01-33BA
(2)	Jig balanced regulator ARP30-02BG
(3)	Mechanical valve with button to balance workpiece 1 VM130-01-33BA
(4)	Regulator for balancing workpiece 1 AR30-02BG-B
(5)	Air operated valve for workpiece selection VR4152-01A-1
(6)	Air operated valve for jig selection VR4152-01A-1
(7)	Regulator for balancing workpiece 2 AR30-02BG-B
(8)	Mechanical valve with button to balance workpiece 2 VM130-01-33BA
(9)	Shuttle valve VR1210-01
(10)	Air operated precision regulator IR412-02G
(11)	Cylinder MB*40-***

Balancing multiple workpieces and forced lifting: Balancing circuit with load sensor

Balanced pressure can be set with a load sensor for multiple workpieces. In this case, the operator feels the load through the time difference until the balanced pressure is set. In order to resolve this, the workpiece is lifted forcefully.



Example of component parts

(1)	Mechanical valve with button to balance jig VM120-01-33BA
(2)	Speed Controller AS2002F-06
(3)	Regulator for setting increased pressure AR20-01BG-B
(4)	Precision Regulator Air operated type IR412-02G
(5)	Cylinder MB*50-***
(6)	Load sensor XT477-3-X1

* Speed controller should be mounted 500mm away from load sensor.

Please contact our sales representative for the details such as usage and sensor positions.

* Please refer to P.G. Information (No: SP154X-008E) for details of the load sensor/XT477-3-X1.

Handling precautions

- During balancing, the weight of the workpiece remains the same. Please be careful of kinetic energy when the workpiece is moved.

Be sure to install a mist separator on the inlet side. Please do not use a lubricator.

- Please use a precision regulator with setting accuracy (the ARP or IR series) for setting balancing pressure for the low pressure side.
- Please connect precision air operated regulators and 2 port valves for block directly to the cylinder when possible. For piping, please use a pipe with φ10 or larger.
- Please use piping of φ8 or larger for the supply side of a precision air operated regulator. Please use piping of φ6 for air operated piping.
- Please consider using a guide as the cylinder receives a lateral load.

Tips for cylinder selection

- For cylinder selection, the allowable percentage of load is approx. 80%, and a smaller bore size will allow for lighter operation.
- Please use a cylinder of φ50 when a load sensor is used.
- Please use a tie rod type without throttle (such as the SMC MB series).

Related Product

Precision Regulator Air operated type　IR412-02G

Max. operating pressure	1MPa
Minimum supply pressure	Set pressure: +0.1 Mpa
Set pressure range	0.01 to 0.7MPa
Sensitivity	Within 0.0014 MPa
Repeatability	Within 0.0035 MPa
Linearity	Within 0.007 MPa
Air consumption	6 to 8ℓ/min （ANR ） (When setting value is 0.3 MPa)
Ambient and fluid Temperature	−5 to 60 ℃ (No freezing)
Gauge	1MPa

Precision Regulator　ARP30-02BG

Max. operating pressure	0.7MPa
Set pressure range	0.005 to 0.4MPa
Sensitivity	0.001MPa
Repeatability	±0.004MPa
Air consumption	1ℓ/min （ANR ） or under （when setting value is 0.4MPa）
Ambient and fluid temperature	−5 to 60 ℃ (No freezing)
Gauge	0.4MPa

Load sensor　XT477-3-X1

Max. operating pressure	0.8MPa
Output pressure range	0.05 to 0.5MPa
Applicable bore size	φ50
Repeatability	±0.025MPa
Ambient and fluid Temperature	−5 to 60 ℃ (No freezing)
Mass	2.0kg
Cylinder mounting part	φ18.5 through hole
Jig mounting part	M22x1.5

Regulator　AR-B Series

Max. operating pressure	1.0MPa
Set pressure range	0.05 to 0.85MPa
Ambient and fluid Temperature	−5 to 60 ℃ (No freezing)
Gauge	1MPa

⚠ Caution: To ensure the safest possible operation of this product, please be sure to thoroughly read the “Safety Instructions” in our “Best Pneumatics” catalog before use.