Optibal W6

Six-Way Ball Valve PN 16
DN 15...20

Optibal W6 with Aktor R rotary actuator.
Actuator not included in the scope of delivery.

Six-way ball valve for switching between cooling and heating in a four-pipe system by means of an Aktor R motorised rotary actuator. The six-way ball valve can be used to control the flow rates via the rotation angle. In conjunction with Kvs orifices or control valves, the cooling and heating circuit can be limited independently of each other.

Body made of dezincification resistant brass. Pipe connection DN 15 external thread with Eurocone according to EN 16313, DN 20 external thread with internal cone.

Kvs orifices 0.25 / 0.4 / 0.63 / 1.0 / 1.6 and 2.5 available as accessories.

Functions

- Switching between cooling and heating
- Flow regulation
- Shutoff

Features

+ Replaces up to four two-way valves with actuator
+ Different Kvs values for heating and cooling possible
+ Automatic hydronic balancing with AQ valves or Cocon QTZ pressure independent control valves

Technical Data

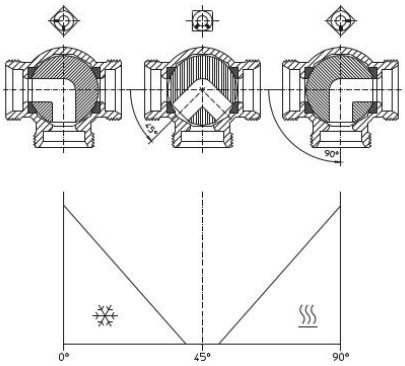
Nominal sizes	DN 15 and DN 20
Variants	External thread with internal cone DN 15 according to EN 16313 (Eurocone)
Operating temperature	0 to 90 °C
Operating pressure	Max. 16 bar / PN 16
Differential pressure	Max. 2 bar
Medium	Heating and cooling water according to VDI 2035 or ÖNORM 5195 Water-glycol mixtures with max. 50 % glycol content
Kvs value	3.2

Product Details

Design

The Optibal W6 consists of two three-way ball valves arranged one above the other, which are connected to each other via a common rotary axis. Via a rotation angle of 90°, either the two left or the two right connections are switched to the middle connections to supply the connected unit with heat or cold. In the middle position, all connections are shut off.

The switchover is performed by the Aktor R rotary actuator, which can also be used to approach intermediate positions. The rotary actuator is mounted to the six-way ball valve with a union nut and acts on the rotary axis via a square. The position of the six-way ball valve is indicated on the rotary actuator. When the rotary actuator is removed, the position can be read off from notches in the square.



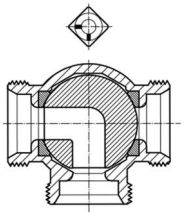
Functions

The Optibal W6 six-way ball valve is used for heating and cooling operation in a four-pipe system with heating/cooling ceilings or fan coil units. Due to its design, it can be integrated in a space-saving way. It combines several functions in one component: the Optibal W6 takes over the tasks of up to four straight valves. This way, not only the space required but also the material and installation costs can be reduced.

Switchover and shutoff

Switching between heating and cooling mode. Switching is done by a corresponding control of the rotary actuator.

COOLING

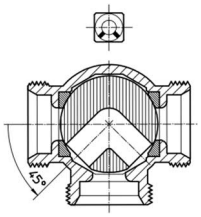


Rotation angle: 0° (fully open)

Actuator control: 0 V

The system connection on the left (typically cooling) to the unit is fully open

SHUTOFF (DEAD ZONE)

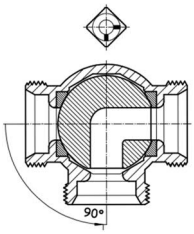


Rotation angle: 45° (shut off)

Actuator control: 5 V

All connections are shut off

HEATING



Rotation angle: 90° (fully open)

Actuator control: 10 V

The system connection on the right (typically heating) to the unit is fully open

Flow regulation

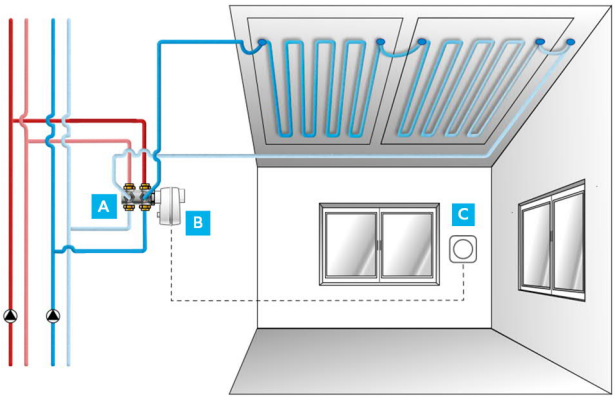
Without further equipment, the Optibal W6 has no regulation function but can only switch. In this configuration, a disproportionately high flow rate is already achieved at a low degree of opening due to the design. However, it is possible to implement different control strategies in combination with other components.

Applications

In combination with the Aktor R rotary actuator and the ClimaCon F 316 room thermostat as well as optional Kvs orifices or a control valve, complete solutions can be composed for flow regulation and individual room control of heating and cooling ceilings and other surface systems for combined heating and cooling.

Note: The ClimaCon F 316 has no integrated control of fan speeds and is therefore not suitable for use with units whose fan is controlled by the room thermostat.

INDIVIDUAL ROOM CONTROL WITHOUT FLOW LIMITATION



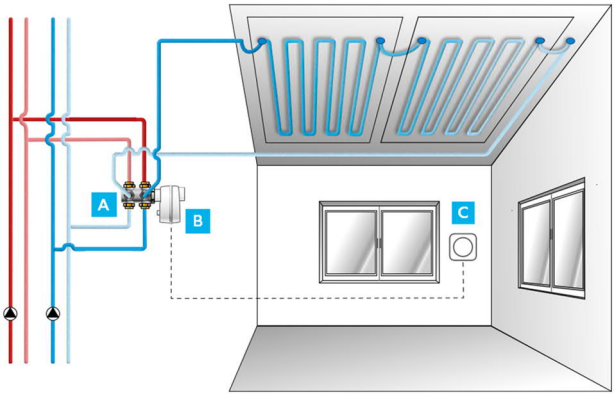
The Optibal W6 is always used with the Aktor R rotary actuator, which was specially developed for the Optibal W6. The ClimaCon F 316 room thermostat, on the other hand, was developed for use with the Aktor R and, if necessary, another Aktor M motorised actuator– see applications below. Modulating control of the Aktor R is carried out by the ClimaCon F 316 via a 0...10 V control signal. The limit voltages for cooling, shutoff and heating are set by default.

The ClimaCon F 316 allows the control of other actuators for six-way valves. This may require parameterisation of the values for the limit voltages, which can be easily carried out with the ClimaCon app.

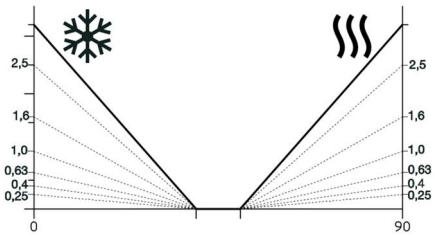
The following components are used for this application:

Position	Item	Notes	Item no.
A	Optibal W**6** six-way ball valve	Select the suitable nominal size. The technical data are identical	1132004 (DN 15) or 1130006 (DN 20)
B	Aktor R rotary actuator	Suitable for all Optibal W6	1132030
C	ClimaCon F **316** room thermostat	Application: “Six-way ball valve alone”	1155536

STATIC FLOW LIMITATION



In conjunction with Kvs orifices, the flow rate for heating and cooling mode can be individually statically limited. The Kvs orifices are inserted in the supply or return of the respective connection before installation of the Optibal W6. Due to the shape of the orifice, they enable an almost linear characteristic line with a modulating 0...10 V control. The design ensures that the orifices are installed in the correct position.



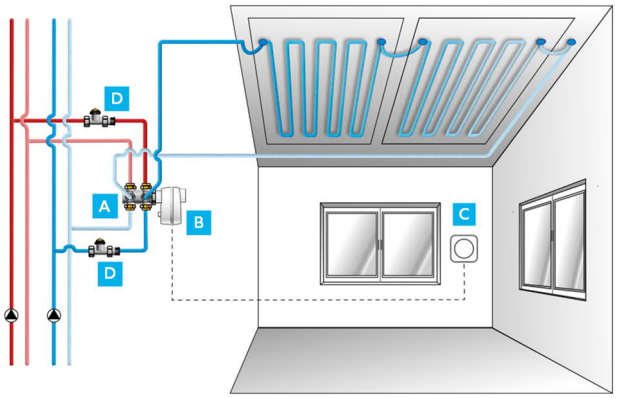
A set of Kvs orifices contains two orifices each with the Kvs value 0.25 / 0.4 / 0.63 / 1.0 / 1.6 and 2.5. Kvs orifices can also be installed later, but not under pressure, as the connection must be exposed for this.

The following components are used for this application:

Position	Item	Notes	Item no.
A	Optibal W**6** six-way ball valve	Select the suitable nominal size. The technical data are identical	1132004 (DN 15) or 1130006 (DN 20)
	Kvs orifices for Optibal W6	Required 1 x per Optibal W6	1132020
B	Aktor R rotary actuator	Suitable for all Optibal W6	1132030

C	ClimaCon F **316** room thermostat	Application" Six-way ball valve alone"	1155536

AUTOMATIC FLOW LIMITATION WITH AQ VALVES



The AQ valve has a pressure-independent control function. The maximum flow rate is set in litres per hour. One AQ valve each is installed in the heating circuit and in the cooling circuit upstream of the Optibal W6. The maximum flow rate of the respective circuit is thus limited and automatically regulated, independent of the differential pressure. The rotary actuator Aktor R of the Optibal W6 acts as a switching valve with modulating control and a 0...10 V control signal. The control signal can be output by the ClimaCon F 316 room thermostat, for example. The ClimaCon F 316 is supplied with the appropriate limit voltages for heating, shutoff and cooling by default.

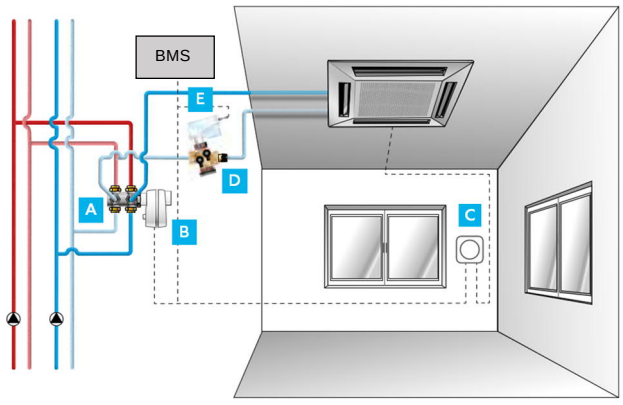
AQ valves can regulate up to 170 l/h, AQH valves (AQ with high flow rate) up to 420 l/h. Both regulate independently of pressure up to a differential pressure of 150 kPa (1.5 bar). It is not necessary to use actuators on the AQ valves, as these are only used for pressure-independent flow limitation. The modulating switching between heating – shutoff – cooling is carried out by the Aktor R rotary actuator.

The use of AQ valves allows pressure-independent flow limitation, individually for the heating and cooling circuit, without installation and wiring of additional actuators.

The following components are used for this application:

Position	Item	Notes	Item no.
A	Optibal W**6** six-way ball valve	Select the suitable nominal size. The technical data are identical	1132004 (DN 15) or 1130006 (DN 20)
B	Aktor R rotary actuator	Suitable for all Optibal W6	1132030
C	ClimaCon F **316** room thermostat	Application: "Six-way ball valve alone"	1155536
From the valves listed in position D, select one for the heating circuit and one for the cooling circuit. The nominal size should match that of the Optibal W6 to avoid reductions.			
D	AQ valve, straight version[1]	Control range 10...170 l/h	1182164 (DN 15) or 1182166 (DN 20)
	AQH valve, straight version[1]	Control range 35...420 l/h	1183194 (only available in DN 15)

AUTOMATIC FLOW LIMITATION WITH COCON QTZ CONTROL VALVES



For larger volume flows, Cocon QTZ control valves can also be used instead of AQ valves. For automatic hydronic balancing, the Cocon QTZ is installed in the return of the consumer, i.e. downstream of the Optibal W6.

The Cocon QTZ is typically equipped with an Aktor M motorised actuator. In this application, the room temperature is controlled via the Aktor M motorised actuator on the Cocon QTZ. Modulating control of the Aktor M is carried out by a 0...10 V control signal. For connection to a building management system, variants of the Aktor M with Modbus RTU connection or with KNX connection are available.

In this application, the Aktor R rotary actuator on the Optibal W6 only works as a switching valve and is controlled via an on/off signal. The ClimaCon F 316 room thermostat is able to perform both the on/off control of the Aktor R rotary actuator and the modulating control of the Aktor M motorised actuator simultaneously. The ClimaCon F 316 has no integrated control of fan speeds and is therefore not suitable for use with units whose fan is controlled by the room thermostat.

When using the Aktor M Modbus actuator on the Cocon QTZ, the Aktor R rotary actuator of the Optibal W6 can also be controlled via the bus and thus integrated into the Modbus.

[1] Also available in angle version.

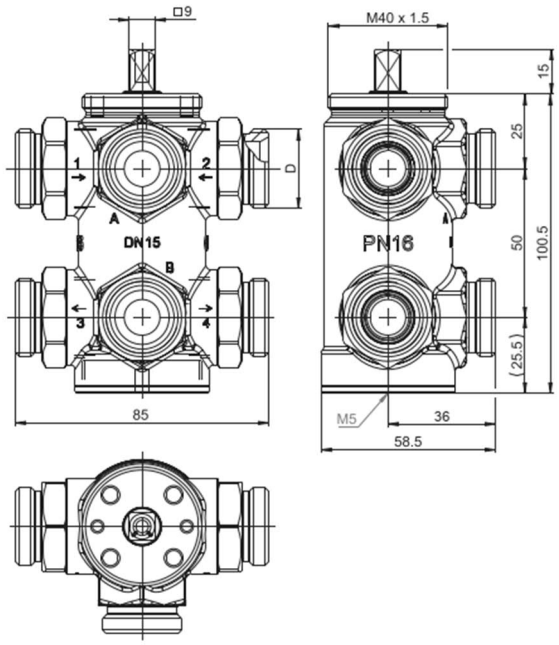
The following components are used for this application:

Position	Item	Notes	Item no.
A	Optibal W**6** six-way ball valve	Select the suitable nominal size. The technical data are identical	1132004 (DN 15) or 1130006 (DN 20)
B	Aktor R rotary actuator	Suitable for all Optibal W6	1132030
C	ClimaCon F **316** room thermostat	Application: “Six-way ball valve and control valve”	1155536
Select only ONE of the valves listed under position D. The nominal size should match that of the Optibal W6.			
D	Cocon QTZ pressure-independent control valve	Control range 30...210 l/h	1147504 (DN 15, without measuring valves) or 1148504 (DN 15, with measuring valves)
		Control range 150...1050 l/h	1147704 (DN 15, without measuring valves) or 1148704 (DN 15, with measuring valves)
		Control range 200...1300 l/h	1147404 (DN 15, without measuring valves) or 1149404 (DN 15, with measuring valves)
		Control range 250...1800 l/h	1147306 (DN 20, without measuring valves) or 1149306 (DN 20, with measuring valves)
All actuators listed under position E fit all Cocon QTZ listed above.			
D	Aktor M motorised actuator	24 V AC/DC, modulating 0...10V	1012717
		With Modbus connection	1012745
		With KNX connection	1012746

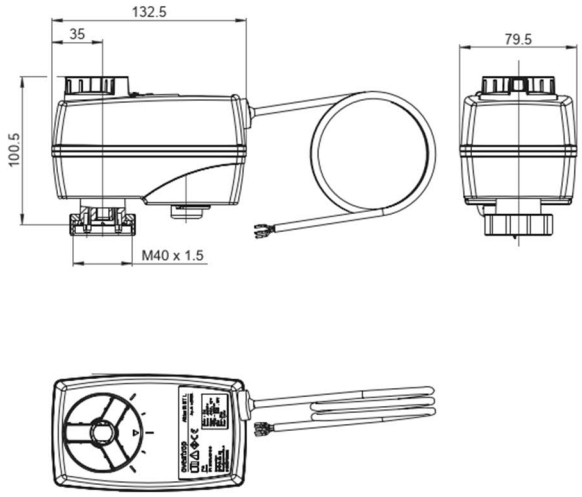
Dimensions

Optibal W6

DN	D	Weight
15	G ¾	1.3 kg
20	G 1	1.3 kg



Aktor R



Complete technical data of the Aktor R:

- https://www.oventrop.com/de-DE/produktesysteme/artikeldetails/1132030
- Or search for “1132030“ at www.oventrop.com.

Item numbers

		Nominal size	Connection	Item no.
	Optibal W**6** Six-way ball valve with external thread and internal cone	DN 15	G ¾	1132004
		DN 20	G 1	1132006

Accessories

Kvs orifice set

		Suitable for	Item no.
	Two each with Kvs values 0.25 / 0.4 / 0.63 / 1.0 / 1.6 and 2.5	All nominal sizes	1132020

Rotary actuator

		Suitable for	Item no.
	Aktor R 24 V, proportional control 0...10 V or on/off control via 24 V forced control. With position feedback signal 0...10 V. Torque: 5 Nm, rotation angle: 90°. With manual override	All nominal sizes	1132030

Room thermostat

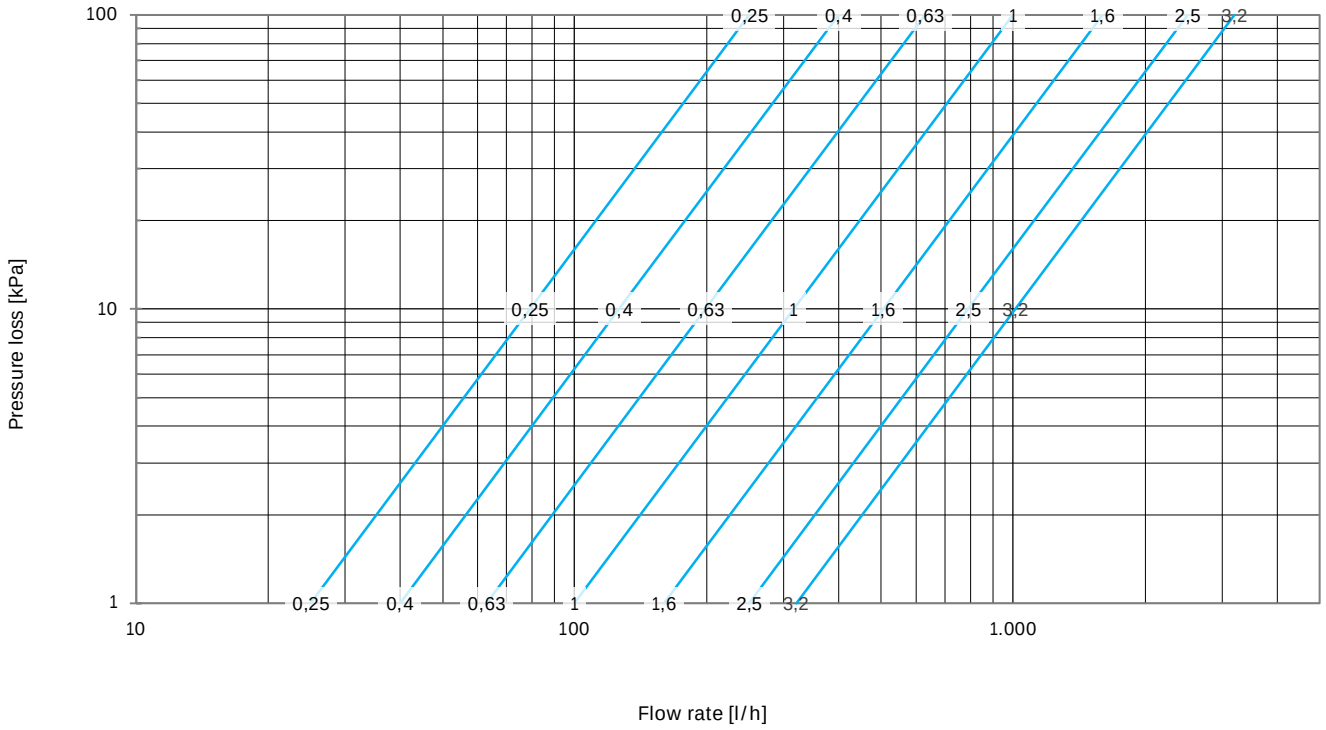
		Suitable for	Item no.
	ClimaCon F **316** Programmable room thermostat for six-way valves. Configured by default for the Optibal W6 with Aktor R. Operation directly on the device or with the ClimaCon app. Configuration or other six-way valves with the ClimaCon app	All nominal sizes	1155536

Fittings

		Size	Suitable for	Item no.
	Connection sets with externally threaded tailpipes Consisting of two tailpipes with O-rings and union nuts.	R ½	DN 15	1140282
		R ¾	DN 20	1140284

Sizing

Flow chart



Kvs values

All nominal sizes

With Kvs orifice (item no. **1132020**), optionally and individually for heating and cooling connection						Without orifice
0.25	0.4	0.63	1	1.6	2.5	3.2

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