

## Fan-coil valves Series 2131 - 3131 - 4131



### Main features

Complete range in the following versions :

- 2-way - DN: 1/2", 3/4", 1"
- 3-way - DN: 1/2", 3/4", 1"
- 3-way with 4 ports - DN: 1/2", 3/4"

- The 3-way version and the 3-way versions with 4 ports can be used as diverting or mixing valves of compact size and reduced weights. The valves are motorized with actuators series 22C or actuators with stroke 2.5 mm with ring nut M30x1.5.

 **WATTS**<sup>®</sup>  
**INDUSTRIES**

A Division of Watts Water Technologies Inc.

## Description

Fan-coil control valves **series 2131, 3131, 4131** are used for controlling the flow of hot or cold water in heating and air conditioning systems. They are operated by electric actuators with max. stroke of 2.5 mm. such as electrothermic actuator **series 22C**.

As standard, the valves are available in the configuration with male thread in the following versions :

- 2-way **series 2131**
- 3-way **series 3131**
- 3-way with 4 ports **series 4131** with built-in by-pass.

Operation of the valve plug is by electrothermic actuator **series 22C**, available in the following versions:

- NO (normally open) 2-wire(Standard) or 4-wire (with auxiliary microswitch contact)
- NC (normally closed) 2-wire (Standard) or 4-wire (with auxiliary microswitch contact)

All actuators of the 22C series can easily be fastened to the valve body with a threaded ring nut. (M30x1.5).



### 2131

Two-way brass valve for fan-coils.  
ON/OFF operation with actuators series 22C.  
Max. operating temperature: 100°C. Disc stroke: 2.5 mm.  
Nominal pressure: 16 bar.

Type	Part number	Dn	Kvs	Weight (g)
2131	213112	1/2" MM	1,7	200
2131	213134	3/4" MM	2,8	200
2131	21311	1" MM	4,5	500



### 3131

Three-way brass valve for fan-coils. ON/OFF operation with actuators series 22C.  
Max. operating temperature: 100°C. Disc stroke: 2.5 mm. Can be used both as mixing and diverting valve, except for version 31311 which can only be used as diverting valve. Nominal pressure: 16 bar.

*The Kvs and by-pass Kvs values given in the table alongside refer to the valve used for diverting service.*

Type	Part number	Dn	Kvs	Kvs By-bass	Weight (g)
3131	313112	1/2" MM	1,7	1,3	200
3131	313134	3/4" MM	2,8	1,8	250
3131	31311	1" MM	4,5	3,1	550



### VU

Tee fitting for creating by-pass in valves series 3131 (Dn 1").

Type	Part number	Dn	Weight (g)
VU	VU311	1" MM	250



**4131**

Three-way brass valve with 4 connections for fan-coils. ON/OFF operation with actuators series 22C. Max. operating temperature: 100°C. Disc stroke: 2.5 mm. Can be used both as mixing and diverting valve. Nominal pressure: 16 bar.

*The Kvs and by-pass Kvs values given in the table alongside refer to the valve used for diverting service.*

Type	Part number	Dn	Kvs	Kvs By-bass	Weight (g)
4131	413112	1/2" MM	1,7	1,3	350
4131	413134	3/4" MM	2,8	1,8	400



**840**

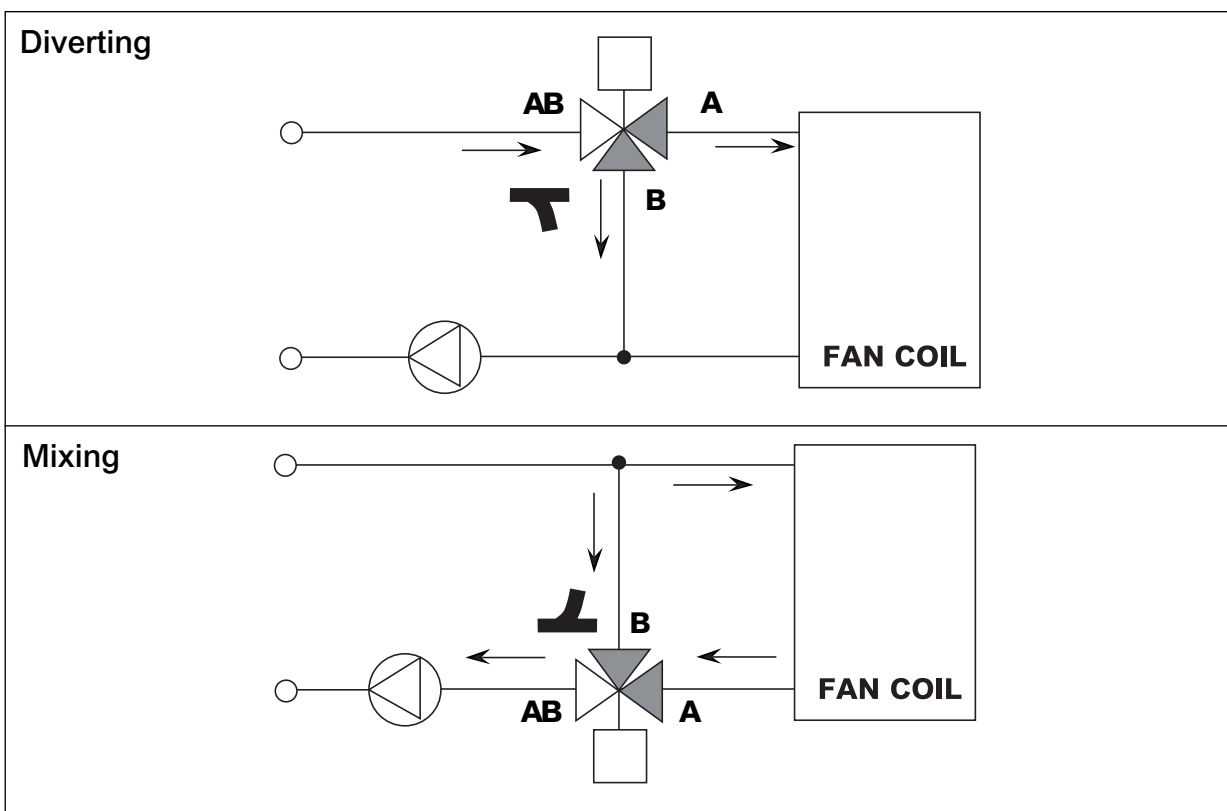
Soft sealed union with nut for zone valves series 2131, 3131, 4131.

Type	Part number	Dn	Weight (g)
840	8401212GAS	1/2" x 1/2"	50
840	8403434GAS	3/4" x 3/4"	50
840	84011GAS	1" x 1"	50

**Application**

The valves are used for shutting off (**series 2131**, two-way) or diverting/mixing (**series 3131 - 4131**, 3-way and 3-way with 4 ports size 1/2" e 3/4"), the heat transfer fluid to a heating or air conditioning system as required by the room thermostat (or timing thermostat).

The 3-way fan-coil valves **series 3131** or 3-way with 4 ports **series 4131**, thanks to the special configuration of the plug controlling the by-pass flow, can be used equally well as diverting or mixing valves (thus optimizing to the full the various plumbing requirements in assembly).



## Operation

Operation of the fan-coil control valves **2131, 3131, 4131** is through the movement of the plug which shuts off the heat transfer fluid: the ON/OFF action of the plug is controlled by the actuator **series 22C** whose internal motor consists of a wax thermostatic element activated by a PTC thermistor against a signal sent by a room thermostat (or timing thermostat). The electrochemical actuator **series 22C**, in the 4-wire version, is provided with an **auxiliary contact** for additional controls (metering, control of pumps, fans or other equipment). The mechanical characteristic of the valves is of the Normally Open type. It can be adjusted or fully closed by manually turning the threaded plastic cap, provided on the valve. This threaded cap acts directly on the valve stem.

When coupled to the **22C NC** actuator, under rest conditions (actuator not energized), the valve becomes

- normally closed (NC) (straight way closed and by-pass open if 3-way type); when the actuator is energized, the valve is opened.

When coupled to the **22C NA** actuator, under rest conditions (actuator not energized), the valve remains

- normally open (NO) (straight way open and by-pass closed if 3-way type); when the actuator is energized, the valve is closed.

The hydraulic flow rate and pressure drops characteristics of the valves are given in appropriate charts; instead, when coupled with the ON/OFF actuators, they assume the characteristics associated with such device.

The three-way valves (or three-way valves with 4 ports) are designed and built to be used both as diverting valves (one inlet and two outlets) and mixing valves (two inlets and one outlet). It is recommended to observe the operating  $\Delta P_{max}$  given in the table in order to avoid risk of malfunctions and/or noise.

The reliability of the fan-coil control valves **2131, 3131, 4131** is guaranteed by the 100% testing on the production, which checks the hydraulic seals of the valve body and its components towards the outside and the seal of the plug in its flow shut-off function.

Design features	
Body	Brass CW617N
Stem	Brass with chemical nickel-plating
Spring	Stainless steel
Plug rubber	EPDM

Technical features common to the entire range	
Max pressure, models w. constant Kv	16 bar
Max pressure, models w. variable Kv	10 bar
Min. fluid temperature	4°C
Max. fluid temperature	110°C
Liquids which can be used	Water (with glycol $\leq$ 50%)
Plug stroke	2.5 mm
By-pass leakage	< 0,02 % Kvs
Actuator connection	Threaded ring nut M30 x 1.5

## Installation

Choice of the fan-coil control valves depends on the type of plumbing systems as well as the required flow rate and pressure drop characteristics.

In systems with 2-way control valves it is advisable to provide by-pass valves **series 466** to ensure a minimum recirculation of the fluid.

Before mounting the valves, make sure that the piping is clean, and free from welding slag or the like.

It is recommended not to install the valve with the 22C actuator facing down.

The valves can be connected by using the soft-sealed tailpieces **series 840** with the range of single-piece or union fittings (3-piece).

The 1" three-way valves can use the TEE fitting (part No. VU311 - DN 1") for making the by-pass.

## Hydraulic characteristics

Valve part number	DN Inches	DN mm	Pre-setting (Kv adjustable)	Port size	Max. operation pressure PN [bar]	Kvs	Kv by-pass	$\Delta P_{max}$ Max. differential operation pressure. (noise < 38 dBA) [bar]	$\Delta P_s$ Close off with actuator 22C NO/NC [bar]	Kvs	Kv by-pass	$\Delta P_{max}$ Max. differential operation pressure. (noise < 38 dBA) [bar]	$\Delta P_s$ Close off with actuator 22C NO/NC [bar]
<b>2 WAY VALVES</b>													
213112	1/2"	15	15A2	16	1,7	-	0,8	2,5	-	-	-	-	-
213112P	1/2"	15	15F2	16	1,7	-	0,8	2,5	-	-	-	-	-
213112DP	1/2"	15	15A2		1,7	-	0,8	4	-	-	-	-	-
213134	3/4"	20	20A2	16	2,8	-	0,7	1,5	-	-	-	-	-
213134P	3/4"	20	20F2	16	2,6	-	0,7	1,5	-	-	-	-	-
213134DP	3/4"	20	20A2	16	2,8	-	0,7	4	-	-	-	-	-
213111	1"	25	25A2	16	4,5	-	0,6	0,7	-	-	-	-	-
213111P	1"	25	25F2	16	4,5	-	0,6	0,7	-	-	-	-	-
213111DP	1"	25	25A2	16	4,5	-	0,6	4	-	-	-	-	-

<b>3 WAY VALVES</b>					<b>Used as DIVERTER VALVE</b>				<b>Used as MIXING VALVE</b>			
313112	1/2"	15	15A3	16	1,7	1,3	0,8	2,5	1,7	1,2	0,7	2
313112P	1/2"	15	15F3	16	1,7	1,3	0,8	2,5	1,7	1,2	0,7	2
313112DP	1/2"	15	15A3	16	1,7	1,3	0,8	4	1,7	1,2	0,7	4
313134	3/4"	20	20A3	16	2,8	1,8	0,7	1,5	2,5	1,6	0,5	1
313134P	3/4"	20	20F3	16	2,8	1,8	0,7	1,5	2,5	1,6	0,5	1
313134DP	3/4"	20	20A3	16	2,8	1,8	0,7	4	2,5	1,6	0,5	1
313111	1"	25	25A3	16	4,5	3,1	0,6	0,7	4,5	3,1	0,4	0,7
313111P	1"	25	25F3	16	4,5	3,1	0,6	0,7	4,5	3,1	0,4	0,7
313111DP	1"	25	25A3	16	4,5	3,1	0,6	4	4,5	3,1	0,4	4

<b>3 WAY VALVES 4 PORT</b>					<b>Used as DIVERTER VALVE</b>				<b>Used as MIXING VALVE</b>			
413112	1/2"	15	15A4	16	1,7	1,3	0,8	2,5	1,7	1,2	0,7	2
413112P	1/2"	15	15F4	16	1,7	1,3	0,8	2,5	1,7	1,2	0,7	2
41311240P	1/2"	15	15I4	16	1,7	1,3	0,8	2,5	1,7	1,2	0,7	2
413112DP	1/2"	15	15A4	16	1,7	1,3	0,8	4	1,7	1,2	0,7	4
413134	3/4"	20	20A4	16	2,8	1,8	0,7	1,5	2,5	1,6	0,5	1
413134P	3/4"	20	20F4	16	2,6	1,8	0,7	1,5	2,5	1,6	0,5	1
413134DP	3/4"	20	20A4	16	2,8	1,8	0,7	4	2,5	1,6	0,5	4
41313440P	3/4"	20	20I4	16	2,8	1,8	0,7	1,5	2,5	1,6	0,5	1

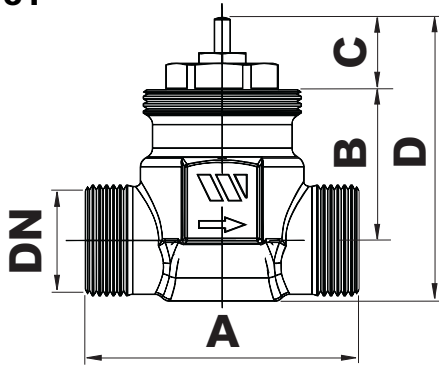
- Red part numbers are standard versions

- KVs = nominal value of the flow in the main way of the valve in m<sup>3</sup>/h with the valve fully open at a pressure of 1 bar and with water temperature at 20 °C
- $\Delta P_{max}$  = maximum dynamic differential pressure at the ends of the fully open valve, without risk of noise (< 38 dBA)
- $\Delta P_s$  = maximum static differential pressure at the ends of the valve against which the valve is able to be opened (through its internal spring for the three-way versions; through the actuator for the two-way versions)

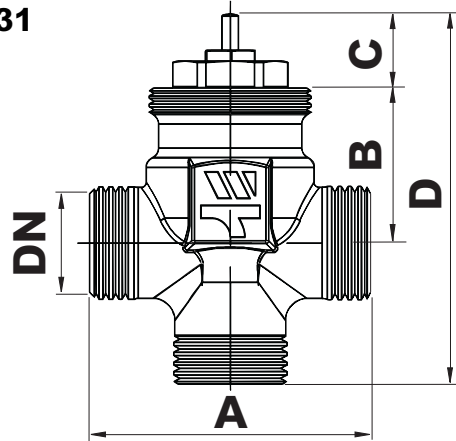
Overall dimensions (mm)

6

2131



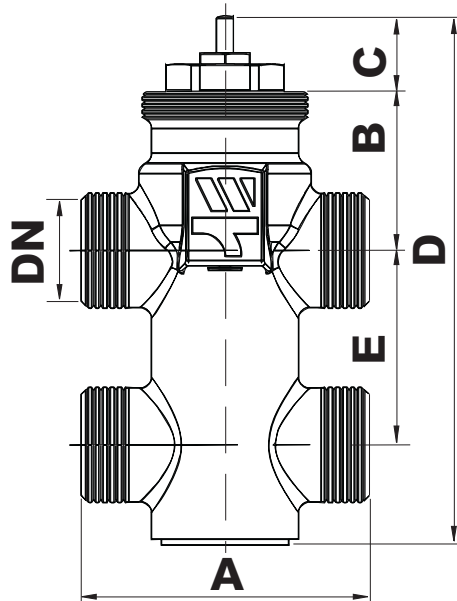
3131



Part number	DN	A	B	C	D
213112	1/2"	52	29	13,5	51
213112P	1/2"	52	29	13,5	51
213112DP	1/2"	52	29	13,5	51
213134	3/4"	56	28	13,5	56
213134P	3/4"	56	28	13,5	56
213134DP	3/4"	56	28	13,5	56
21311	1"	82	30,5	13,5	77,5
21311P	1"	82	30,5	13,5	77,5
21311DP	1"	82	30,5	13,5	77,5

Part number	DN	A	B	C	D
313112	1/2"	52	29	13,5	68,5
313112P	1/2"	52	29	13,5	68,5
313112DP	1/2"	52	29	13,5	68,5
313134	3/4"	56	28	13,5	69,5
313134P	3/4"	56	28	13,5	69,5
313134DP	3/4"	56	28	13,5	69,5
31311	1"	82	38	13,5	92,5
31311P	1"	82	38	13,5	92,5
31311DP	1"	82	38	13,5	92,5

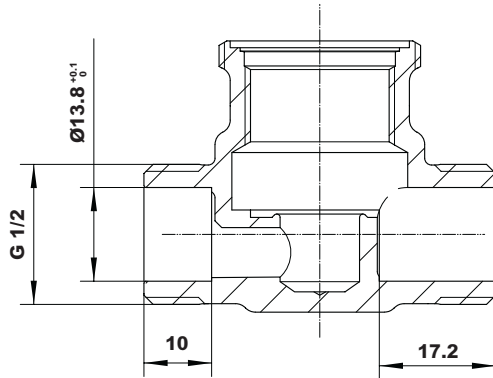
4131



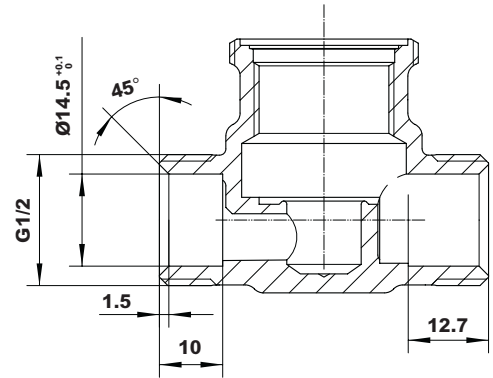
Part number	DN	A	B	C	D	E
413112	1/2"	52	29	13,5	95,5	35
413112P	1/2"	52	29	13,5	95,5	35
413112DP	1/2"	52	29	13,5	95,5	35
41311240P	1/2"	52	29	13,5	100,5	40
41313440P	3/4"	56	28	13,5	102,5	40
413134	3/4"	56	28	13,5	112,5	50
413134P	3/4"	56	28	13,5	112,5	50
413134DP	3/4"	56	28	13,5	112,5	50

**Connections dimensions (mm)**

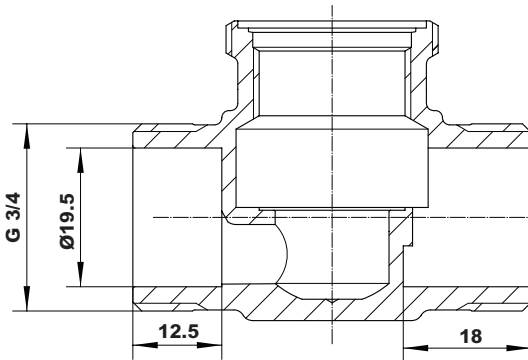
**15F2**



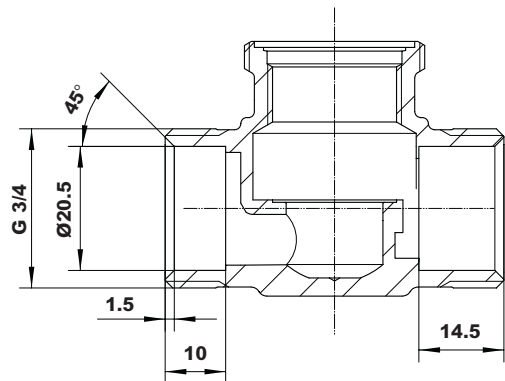
**15A2**



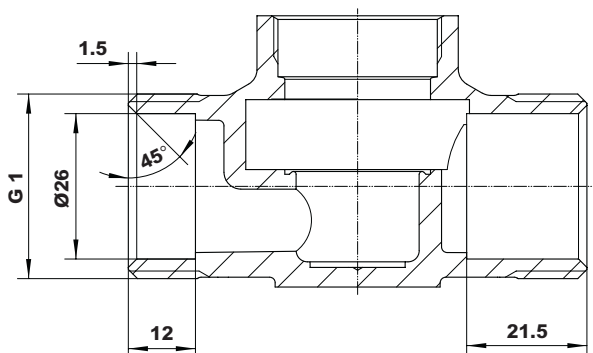
**20F2**



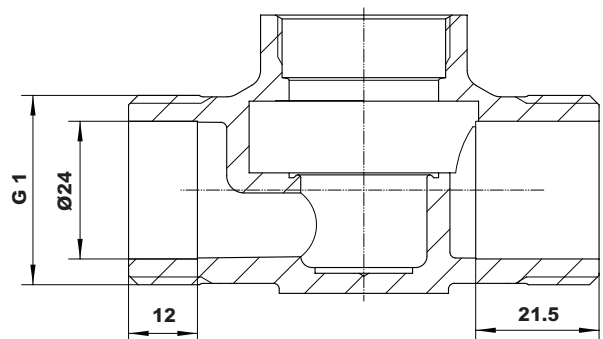
**20A2**



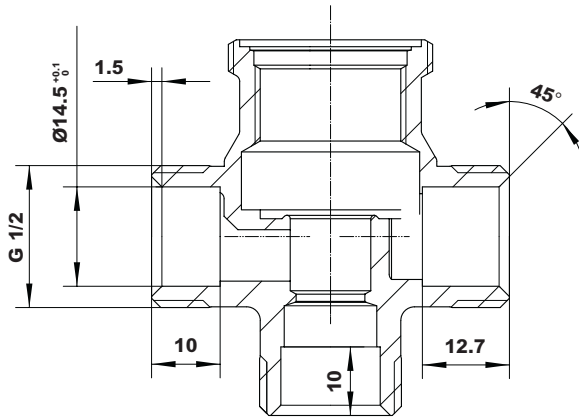
**25A2**



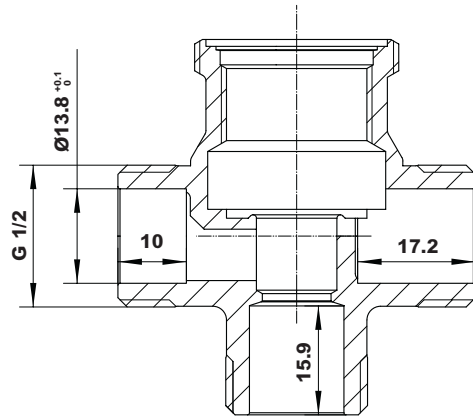
**25F2**



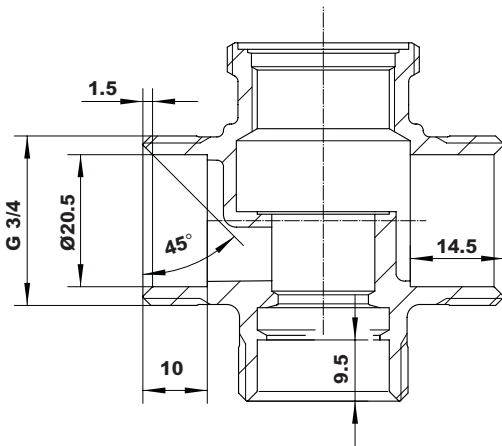
15A3



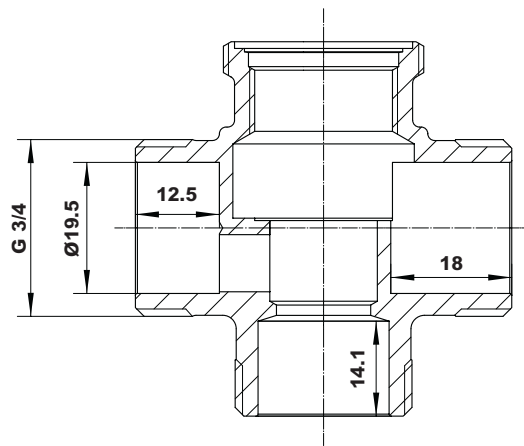
15F3



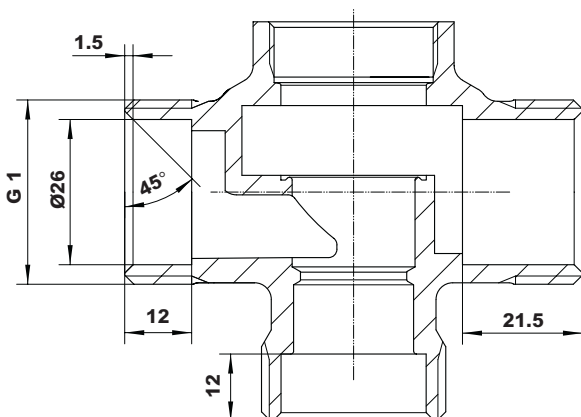
20A3



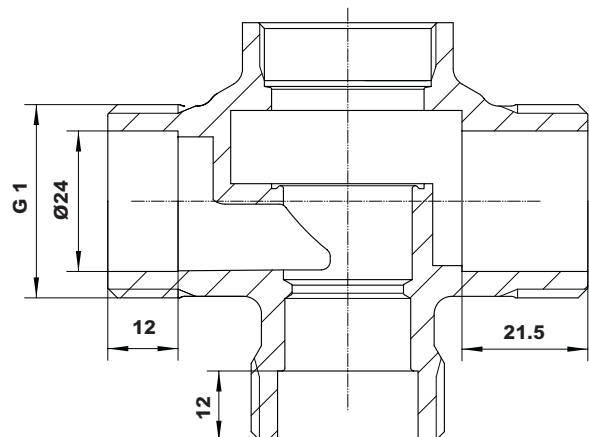
20F3



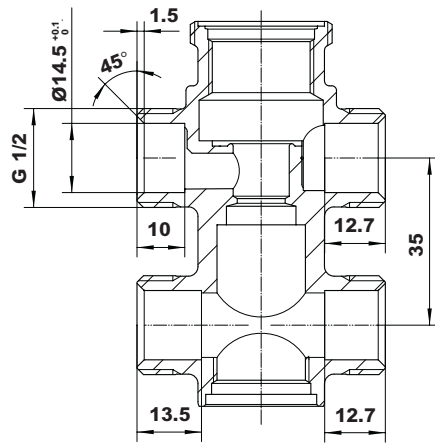
25A3



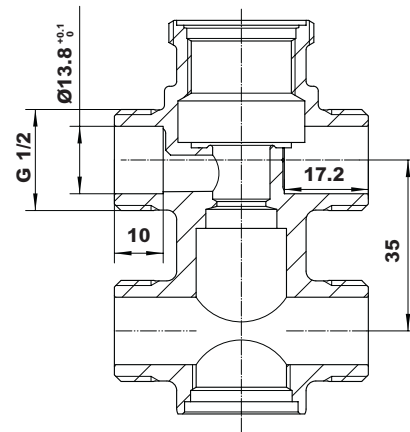
25F3



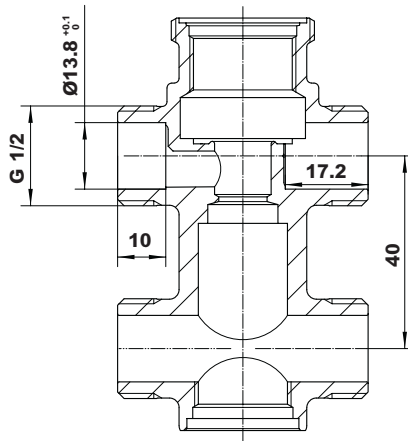
**15A4**



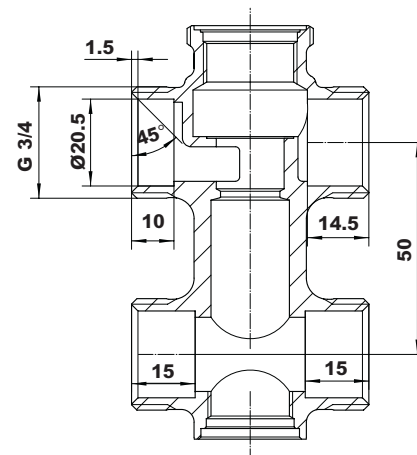
**15F4**



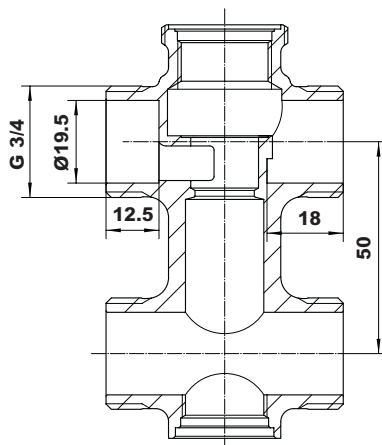
**15I4**



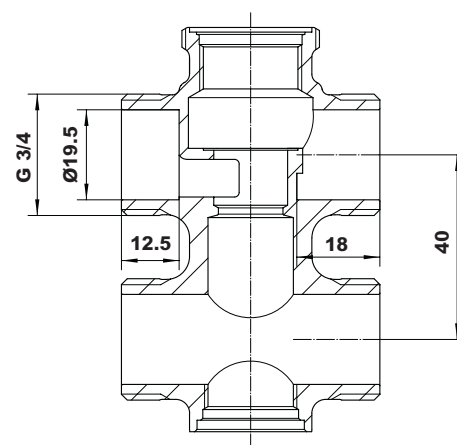
**20A4**



**20F4**



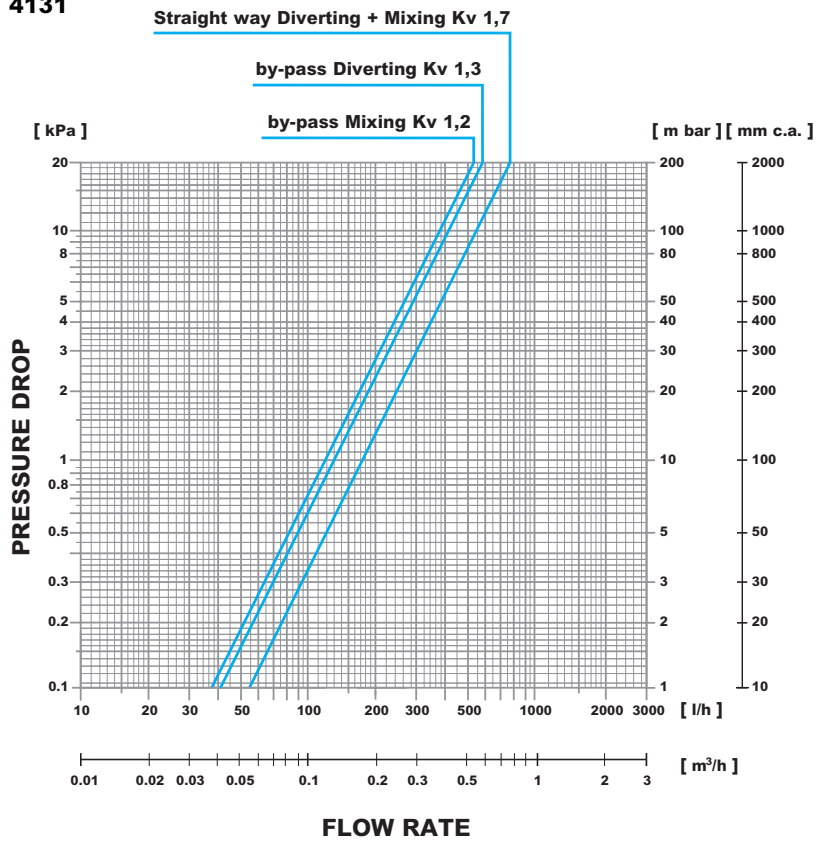
**20I4**



Flow rate/pressure drop charts

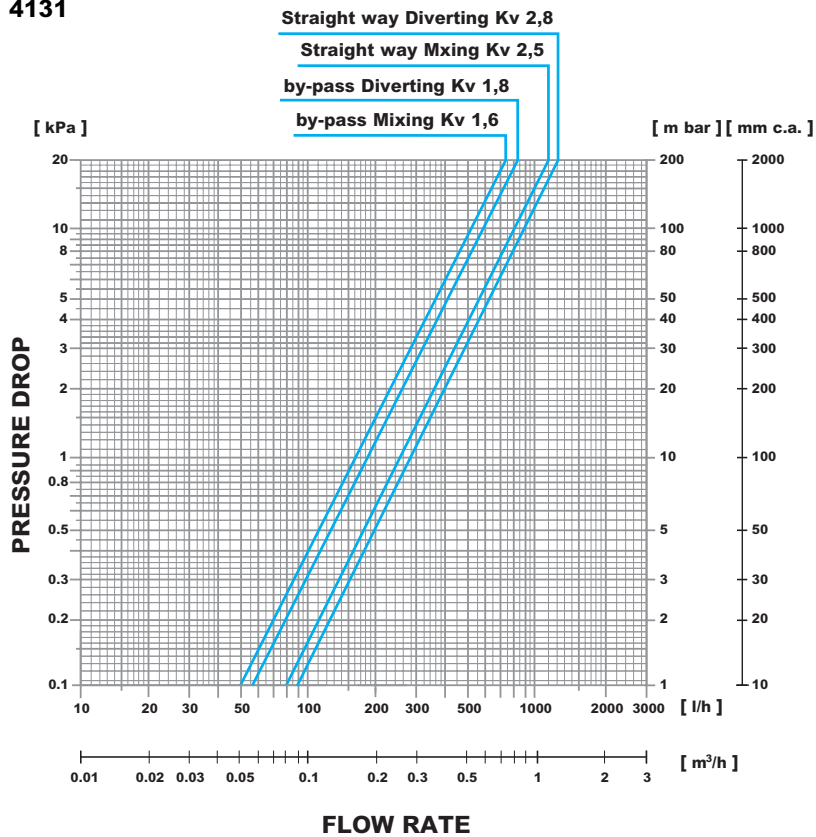
2131 - 3131 - 4131

DN 1/2"

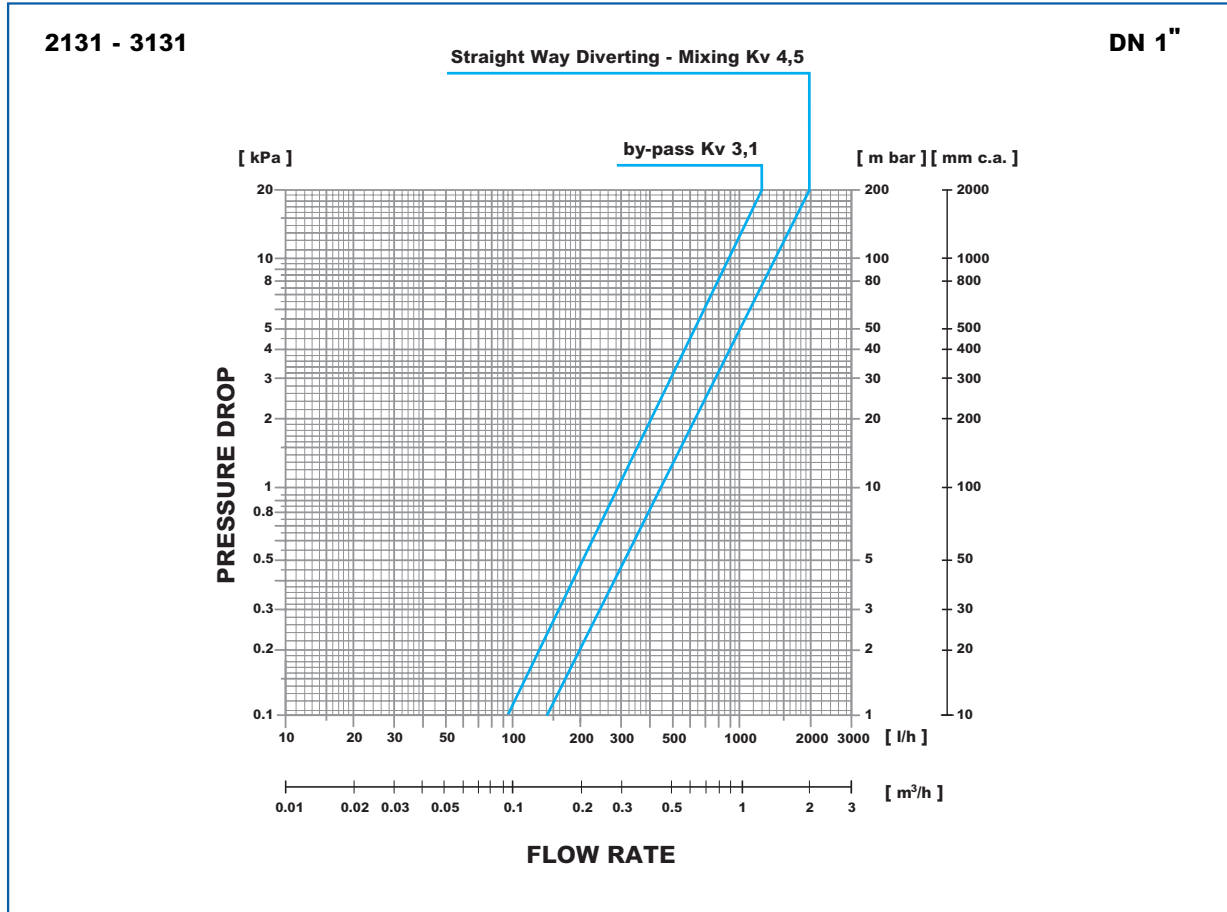


2131 - 3131 - 4131

DN 3/4"



**Flow rate/pressure drop charts**





**Watts Industries Italia S.r.l.**