DOUBLE ADJUSTMENT THERMOSTATIC VALVES AND THERMOSTAT CONTROL DEVICE

FUNCTION

Thermostatic valves are used to regulate and cut-off the flow of the heat transfer fluid that circulates inside air-conditioning system terminals (radiators, fan coils, etc.).
Thermostat control devices are used in combination with the thermostatic valves to automatically regulate ambient temperature wherever they are installed, keeping the temperature at a preset value. This avoids the needless wasting of heat and provides a considerable saving of energy.

THERMOSTATIC VALVES

776

777

778

779

THERMOSTAT CONTROL DEVICE

1101

ELECTRO-THERMIC CONTROL DEVICE

979 - 980

PRODUCT RANGE

THERMOSTATIC VALVES – COPPER, MULTI-LAYER, POLYETHYLENE PIPE

Angled Pipe fitting Radiator
776 Angled thermostatic valve for multi-layer, polyethylene and copper pipe M24x1.5 G1/2”
Straight
777 Straight thermostatic valve for multi-layer, polyethylene and copper pipe M24x1.5 G1/2”

THERMOSTATIC VALVES – IRON PIPE

Angled Pipe fitting and Radiator
778 Angled thermostatic valve for iron pipe G3/8” - G1/2” - G3/4”
Straight
779 Straight thermostatic valve for iron pipe G3/8” - G1/2” - G3/4”

THERMOSTAT CONTROL DEVICE

Item Code Connection
1101 Thermostat control device with built-in sensor, with liquid-sensitive component 821101AC20 M30x1.5

MATCHING FITTINGS

For heating systems with copper, polyethylene or multi-layer polyethylene pipes, use the following fittings to connect ICMA thermostatic expansion valves to the heating system:

Item Fitting Thread
90 Patented SICURBLOC fitting for copper pipe M24x1.5
100 Fitting for multi-layer, polyethylene pipe M24x1.5

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DOUBLE SETTING THERMOSTATIC VALVES

ICMA thermostat control devices can be installed on all thermostatic valves of this line to convert heating systems with **manual** operating mode to **automatic** operating mode.
To install the thermostat control device, simply replace the thermostatic valve knob with an ICMA thermostat control device. This is done with a few easy operations. These are described in detail in the paragraph "Thermostat Control Device Installation and Regulation".
The valves come in "straight" and "angled" versions so that they can be connected to two different types of pipes, at the side of the heating system:

– The valves with GAS thread (side of heating system) are designed for connection to a steel pipe.
– The valves with standard ICMA thread (side of heating system) are designed for connection to a copper pipe, a polyethylene pipe and a multi-layer polyethylene pipe, for which specific pipe fittings are provided.

Pressure loss can be detected by following the indications provided in the diagrams shown in the paragraph "Fluid Dynamic Characteristics".

TECHNICAL SPECIFICATIONS

Performance

Fluids used:	Water and glycol solutions
Maximum percentage of glycol:	50%
Maximum operating pressure:	10 Bar
Maximum differential pressure:	1 Bar (with control device mounted)
Temperature of heat transfer fluid:	5 to 120°C
Valve obturator travel:	3.5 mm
Connection with thermostat control devices:	M30x1.5
Pre-setting condition:	Position 5

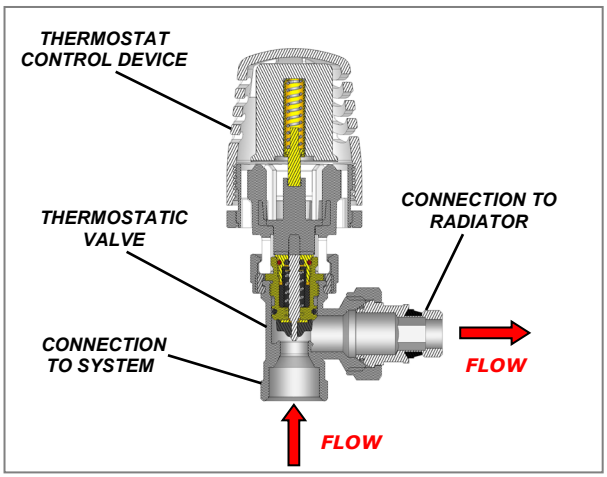
Materials

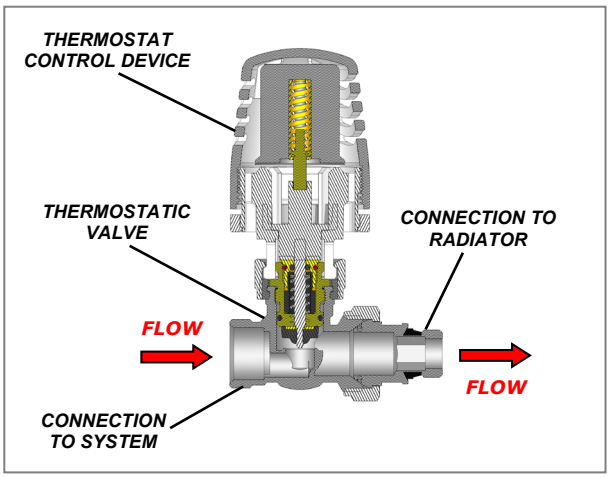
Body, cap and socket union:	CW617N Brass - UNI 12165 – Nickel-plated
Large screw:	CW617N Brass - UNI 12164
Spring and obturator control rod:	Stainless steel
Liquid sealings:	Peroxy EPDM
Control knob:	Nylon 6 – 30% Fibreglass (White)

VALVE INSTALLATION

Install ICMA thermostatic valves on the heating system making sure to observe the direction of flow. The fluid must enter from the side on which the valve is connected to the system and go out toward the heating body.
The following problems can occur if the valve is installed incorrectly:

- A noise similar to a continuous sound of heavy hammering is due to the passage of fluid through the valve in the wrong direction. This problem can only be solved by inverting the valve with holder on radiators that have this problem, thus restoring the correct direction of flow of the fluid inside the valve.
- A noise similar to a sound of heavy whistling during the succession of specified on and off times is due to an excessive flow inside the valve. This problem can be solved by keeping the system pressure under control, and equipping the system with variable rotation pumps along with differential pressure regulators, or by making use of differential by-pass valves.





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WHAT IS A DOUBLE ADJUSTMENT THERMOSTATIC VALVE

Double adjustment thermostatic valves have a double regulation system that allow to limit the maximum flow of valves in fully open condition.
This regulation doesn't affect or modify the standard functioning of valves during work both "manual" either "automatic.
The "double adjustment" is set at the factory during the final testing of the valves at the maximum flow rate, it is advisable not to modify it unless specific requirements are met.
The choice of the valve model and its dimensions must be in accordance with the plant requirements and the required hydraulic characteristics such as: flow rate and leakage.

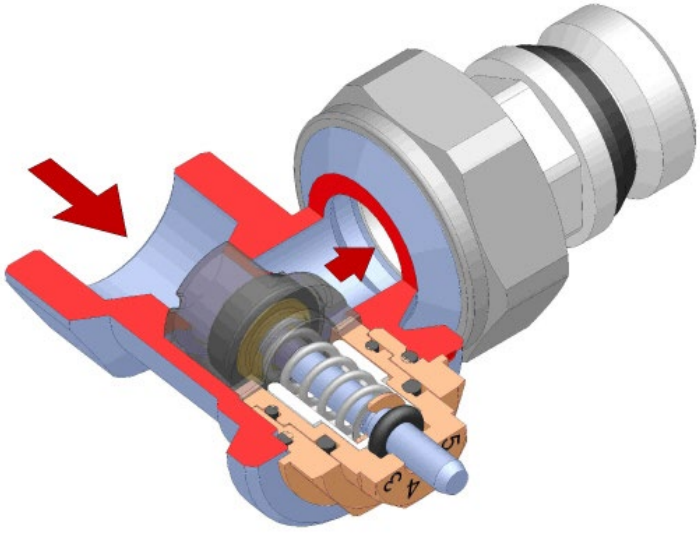


Fig. A

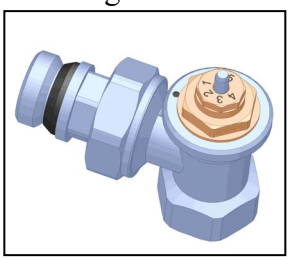


Fig. B

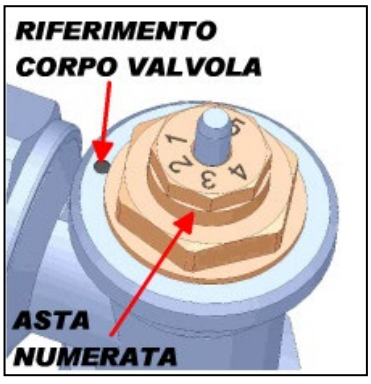
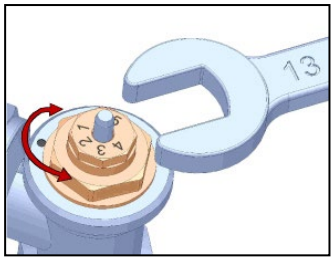


Fig. C



"DOUBLE ADJUSTING" FUNCTIONING

As mentioned above, the "double regulation" system allows limiting the maximum flow rate of a valve to the complete opening condition, which simplifies the balancing of a plant or the setting of the Kv of each single valve.
To change the "double adjustment" you need to do the following:
1) Remove the cap or thermostatic head on the thermostatic valve (the valve will show as in fig. A).
2) Rotate the appropriate actuating rod (fig. B), matching the number shown with the reference on the valve body using a key (Fig. C)
- The numbers 1 to 5 on the operating rod indicate the 5 different fluid flow resistors

In the section "Fluid dynamics" at the bottom of this data sheet, there are diagrams of the load losses related to the different valve models and their measurements.
The numbered curves on the diagrams correspond to the number on the maneuvering rod and consequently to the degree of valve adjustment:

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THERMOSTAT CONTROL DEVICE

Thermostat control devices are used to regulate ambient temperatures automatically wherever they are installed so that the temperature is kept at a preset value.
Residential and working environments often contain other sources of heat, such as electrical appliances, stove-top cookers, computers, servers, and simple sunlight. Combined with the heating system, these additional heat sources cause a needless, uncontrolled increase in ambient temperature and the wasting of heat. Thermostat control devices detect variations in ambient temperature in the environments in which they are installed making it possible to keep the heat supplied by the heating system at optimal temperatures and to provide a considerable saving of energy.
The ICMA, 1101, thermostat control device can be installed on all thermostatic valves of this line.
ICMA valves are supplied with the current manual control knob (for manual operation). The valves can be converted into thermostatic valves that function completely automatically by installing a thermostat control device.
To install the thermostat control device, simply remove the thermostatic expansion valve control knob and replace it with the 1100 thermostat control device. This is done with just a few easy operations. These are described in detail in the paragraph "Thermostat Control Device Installation and Regulation".

1101

ADJUSTMENT SCALE

Adjustment scale: * to 5
Temperature adjustment range: 7 to 28°C

The asterisk * indicates the freezing protection position, which corresponds to 7°C.

ADJUSTMENT SCALE						
0°C	7°C	12°C	16°C	20°C	24°C	28°C
0	*	1	2	3	4	5

TECHNICAL SPECIFICATIONS

Performance

Minimum adjustment calibration (anti-freeze position):	t_s min	7°C (*)
Maximum adjustment calibration (position):	t_s max	28°C (5)
Saving condition (position):		20°C (3)
Maximum working pressure:	PN	1000 KPa
Maximum differential pressure:	Δp	100 KPa
Nominal capacity "q_m N" (DP=10 KPa) angle-straight:	q_m N	191 to 195 Kg/h
Maximum working temperature:		110°C
Maximum storage temperature:		50°C
Hysteresis:	C	0.25 K
Authority:	a	0.9
Response time:	Z	27 min
Differential pressure influence:	D	0,55 K
Water temperature influence:	W	0,6 K
Connection to thermostatic expansion valves:		M30x1.5

Thermostat control device conform with Standard: EN215
The thermostatic valve is fitted with manual adjustment handwheel (rotation)

Materials

Knob and stop ring:	RAL 9010 ABS White
Body and transmitter:	RAL 9010 PA6 30% F.V.
Sensor liquid:	Thermostatic ethyl-acetate
Connection ring:	CW617N Brass - UNI 12164 - Nickel-plated
Compensation pin:	CW617N Brass - UNI 12164
Compensation pin spring:	SH steel for springs - Phosphated

OPERATION

The thermostat head is made of a series of plastic parts containing a thermostatic component that is sensitive to temperature variations.
Operation of the thermostatic component is based on the expansion of the thermostatic liquid contained inside it:

– when the ambient temperature rises, the thermostatic liquid increases in volume, resulting in the lengthening of the component;
– when the ambient temperature drops, the thermostatic liquid decreases in volume, resulting in the shortening of the component.

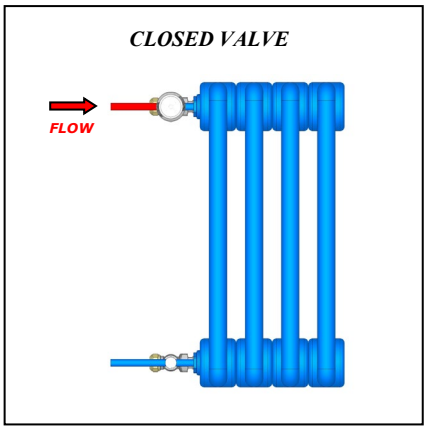
The variations in length of the thermostatic component are transmitted to the valve obturator by a small steel rod. These movements constantly regulate the flow of the heat transfer fluid to the heating component so that the temperature set on the thermostat control device remains constant over time.

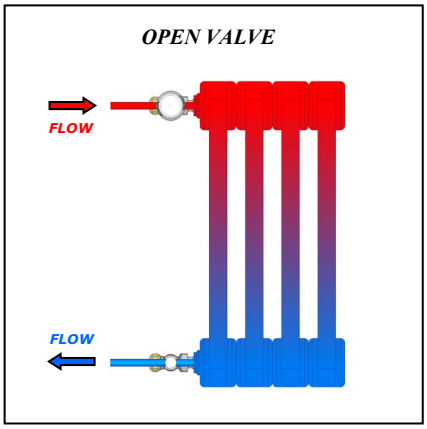
The thermostat control device components are specially made of plastic materials to prevent the valve heat and that irradiated by the heating component from being transmitted to the thermostatic component by contact or induction. This prevents possible malfunctions in the control device.

The thermostat control device temperature is regulated by turning the numbered knob and bringing the corresponding symbol to the desired temperature close to the head indicator (see the following paragraph for more details).

- Position 3 on the adjustment scale corresponds to an ambient temperature of 20°C. This is the recommended temperature for ensuring a comfortable environment and reduced heat consumption and costs.

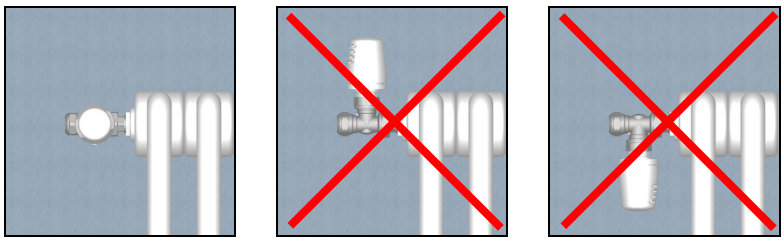
– The asterisk "*" indicates the freezing protection position. When the thermostat control device is set to this position, the valve turns on only if the ambient temperature drops below 6°C.
This setting is recommended when one is absent for long period of time during the winter months, or when one wishes to aerate the premises when outside temperatures are very low.





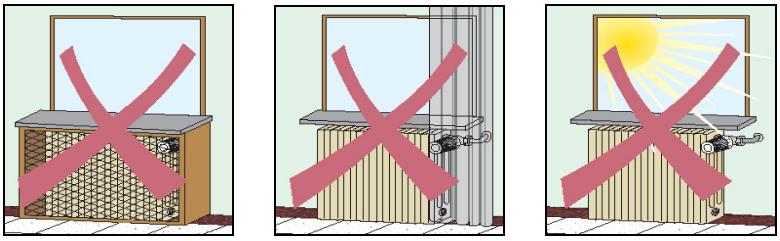
DIRECTION OF THERMOSTAT CONTROL DEVICE

The ICMA thermostat control devices should be installed in the horizontal position. Any other position could compromise their correct functioning.



POSITIONING OF RADIATORS

The thermostat control devices should never be placed inside niches or radiator boxes, behind curtains or exposed to direct sunlight. These conditions could result in incorrect detection of the actual ambient temperature and compromise the proper functioning of the device.



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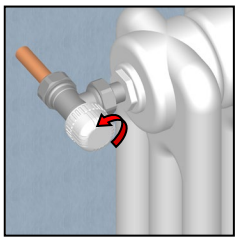
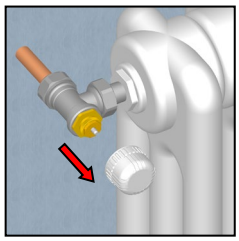
THERMOSTAT CONTROL DEVICE INSTALLATION AND REGULATION

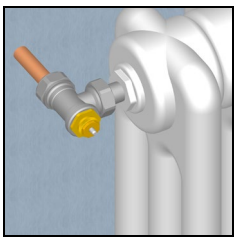
CONVERSION OF MANUAL VALVES TO THERMOSTATIC VALVES



Turn the white knob in the counter clock-wise direction to remove it completely from the valve.

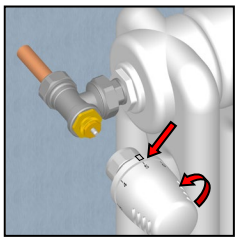


Remove the knob and store it for possible use in the future.

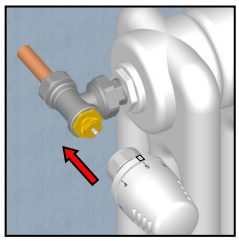


The valve will appear as shown above.

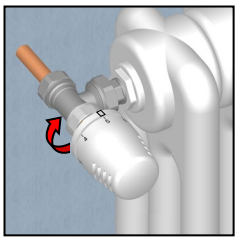
INSTALLATION OF THERMOSTAT CONTROL DEVICE



To facilitate installation of the thermostat control device, turn the knob counter clockwise and bring it to the number 5.

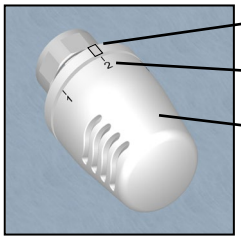


Install the thermo-stat control device on the valve body keeping the indicator turned upward so that it is clearly visible.



Screw the thermostat control device ring on the valve body blocking it. Turn the knob a few times to adjust the components.

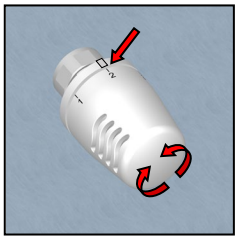
TEMPERATURE ADJUSTMENT



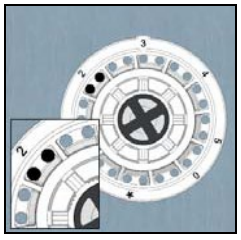
The knob indicates the numbers from 0 to 5, which correspond to specific temperatures (see the adjustment scale shown at side).
Set the desired temperature simply by turning the knob to the corresponding number close to the indicator.

ADJUSTMENT SCALE						
0°C	7°C	12°C	16°C	20°C	24°C	28°C
0	*	1	2	3	4	5

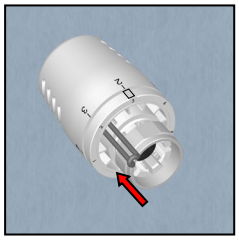
BLOCKING OF TEMPERATURE



Turn the thermostat control device knob to one of the setting numbers from 0 to 5 shown on the knob. Setting example on the

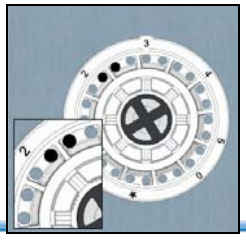


The same numbering is also indicated on the lower part of the device. Identify the hole before and the hole after the number set.

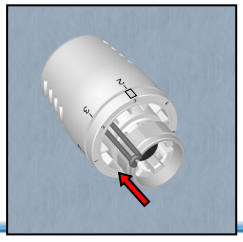


Insert the forked pin inside these two holes and push until completely inserted. The knob is now blocked at the desired setting.

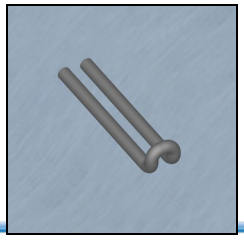
LIMITATATION OF TEMPERATURE



In order to limit the temperature, simply identify the two holes located right after the number set.



Insert the forked pin inside these two holes and push until completely inserted. The knob can now be move from 0 to the



The forked pin is sold separately from the control device.

FORKED PIN CODE:

111100AC06

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ELECTROTHERMAL CONTROL DEVICE

NORMALLY CLOSED (NC) Electrothermal Actuators are ON-OFF electrical devices specially designed to be installed on ICMA thermostatable items: distribution manifolds, zone valves and fan coil valves.
Electrothermal actuators have the function of automatically intercepting the heat transfer fluid in heating / cooling systems and are controlled by a simple room thermostat.
The electrothermal actuators of this series are equipped with a valve opening / closing indicator and are equipped with a quick-release system that facilitates installation and maintenance.
Articles 979 and 982 also have a clean contact that can be used to operate a boiler, pump or other.

European Directives Conformity

CE mark according to directives:
2006/95 / EC and 2004/108 / EC

PRODUCT LINE

PN	*Description*	*Connection*	*Voltage*	*Code*
980	Electrothermic actuator ON-OFF	M30x1.5	24 V	82980NC54
980	Electrothermic actuator ON-OFF	M30x1.5	230 V	82980NC53
979	Electrothermic actuator ON-OFF with potential free contact	M30x1.5	24 V	82979NC54
979	Electrothermic actuator ON-OFF with potential free contact	M30x1.5	230 V	82979NC53

TECHNICAL FEATURES

Part Number:	**980**	**979**
Type:	Without microswitch	With microswitch
Nominal tension:	24V / 230V	24V / 230V
Frequency:	50÷60 Hz	50÷60 Hz
Starting current:	0.2 A (230V) / 0.3 A (24V)	0.2 A (230V) / 0.3 A (24V)
Working current:	8 mA (230V) / 70 mA (24V)	8 mA (230V) / 70 mA (24V)
Power absorbed in continuous operation:	2W	2W
Movement type:	Linear	Linear
Max actuator range:	5 mm	5 mm
ICMA valves range:	3,5 mm	3,5 mm
Opening start timing:	ca 90 sec	ca 90 sec
Fully open timing:	ca 3 min	ca 3 min
Fully close timing:	ca 4 min	ca 4 min
Dynamic power:	100 N	100 N
Working temperature:	0°C ÷ 50°C	0°C ÷ 50°C
Storage temperature:	-25°C ÷ +60°C	-25°C ÷ +60°C
Threaded ferrule connection:	M28x1,5 / M30x1,5	M28x1,5 / M30x1,5
Connection wire:	Flame resistant - Bipolar	Flame resistant - Quadrupole
Connection wire lenght:	2x0,5 mm² L= 1 m	4x0,35 mm² L= 1 m
Protection grade:	IP 53	IP 53
Electrical insulation class:	Class II	Class II

FUNCTIONING

When installing a NC actuator on a thermostatically controlled ICMA valve, the lowering of its shutter and the consequent closure of the flow of the heat transfer fluid to the circuit are determined.

- **WHEN OPERATING TENSION IS APPLIED, THE CONTROL VALVE OPEN**
  When the actuator voltage is applied, the thermostatic element inside it warms, expands, and with a linear shutter motion determines the opening of the controlled valve and the relative flow of the heat conductor to the circuit.
- **WHEN REMOVING TENSION ON THE ACTUATOR, THE CONTROL VALVE IS CLOSED**
  When the tension is lost to the actuator, the thrust of a suitable spring inside it brings it back to the closed position, thus closing both the controlled valve and the flow of the heat transfer fluid in the circuit to which it is coupled.

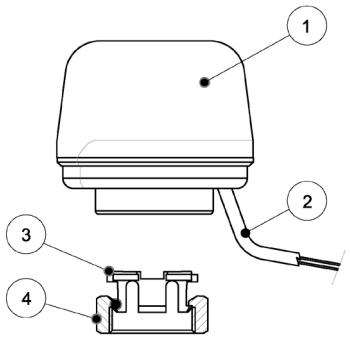
OPEN/CLOSE INDICATOR

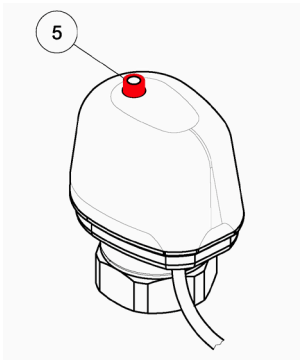
At the top of the actuator there is a "red indicator pin" (see side-by-side) that moves with the opening / closing of the controlled valve:
- RED STEEL fully inserted in the actuator ==> VALVES CLOSED
- RED STEEL out of the actuator for about 3.5 mm => OPEN VALVE

POTENTIAL FREE CONTACT

Articles 979 and 982 (4-wire) have a "normally open" (NA) potential free contact, this contact closes only when the actuator is energized By feeding the actuator, the controlled valve passes from the closing condition to the opening condition; Reaching the full opening position, the microswitch inside the actuator closes the clean contact.
The "clean contact" can withstand a maximum load of 1 Ampere and can be used to operate a boiler, recirculation pump with relay or other accessories.

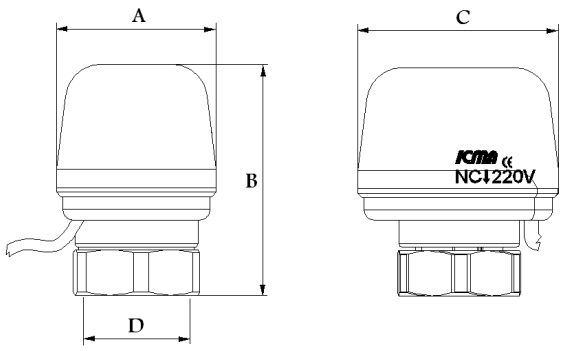
COMPONENTS AND DIMENSIONS





COMPONENTS

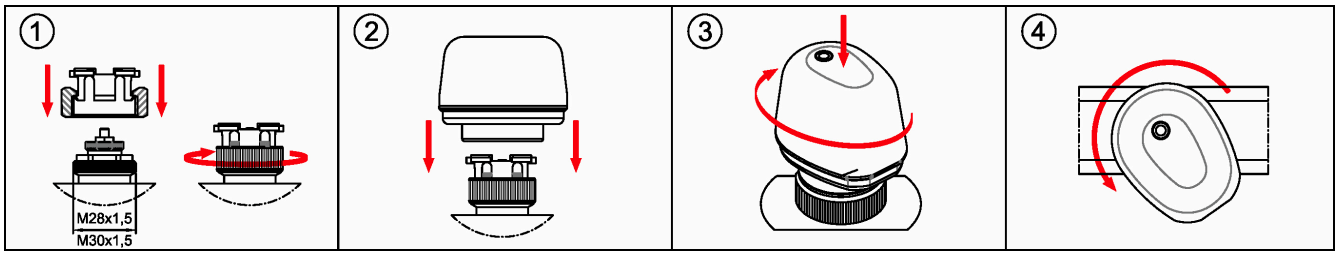
1) Electrothermic actuator
2) Electrical cable
3) Fast lock base
4) Threadeed ferrule
5) Red indicator pin



CODE	A	B	C	D
982	44	63	57	M28x1.5
979	44	63	57	M30x1.5

INSTALLATION

Electrothermal NC actuators can be installed across the range of ICMA thermostatic products: distribution manifolds, zone valves and fan coil valves.
A special threaded nut makes it easy to fasten the base of the quick-release coupling to the valve without having to remove it any longer, even in the event of any maintenance or replacement of the actuator.
To engage / disengage the thermostatic command to the quick coupler, simply a simple pressure / rotation operation will suffice (see the steps below).
This type of coupling also allows you to direct the command to the desired position to obtain a correct and orderly power supply layout.



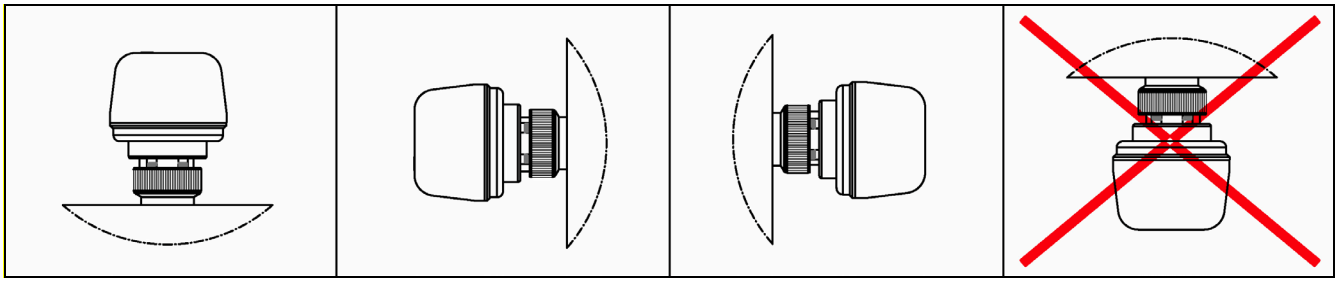
Remove the white cap on the valve or on the bulb of the manifold bar.
Insert the fastener onto the screwdriver and tighten the ring until end of stroke.

Insert the actuator on the quick hook by centering the slots on the clamp with the four fastening lugs.
Press down to the manifold.

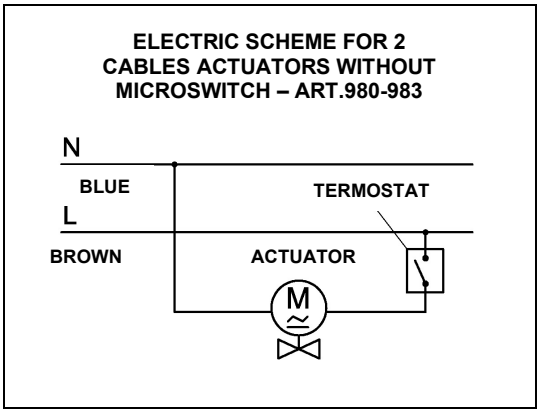
Keeping the actuator pressed against the quick-release fastener, turn it clockwise until the end of the stroke by locking it.

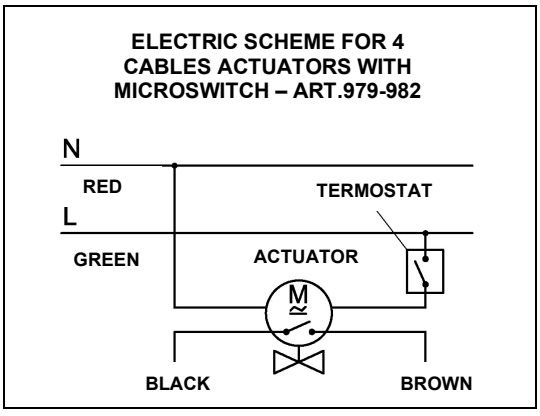
To remove the electrothermal actuator from the quick coupling it will be sufficient to rotate it counterclockwise.

We recommend installing the electrothermal actuators in a horizontal or vertical position, never overturned! Condensation on valves and manifolds could get out of control and damage it.
For the same reason, it is always advisable to install the electrothermal actuators in dry places and away from any possible point of contact with water or various liquids.



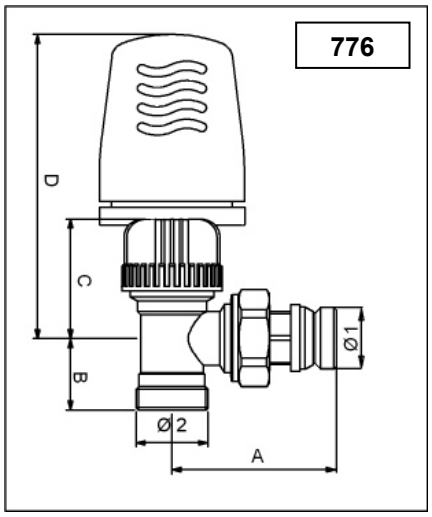
ELECTRICAL CONNECTION



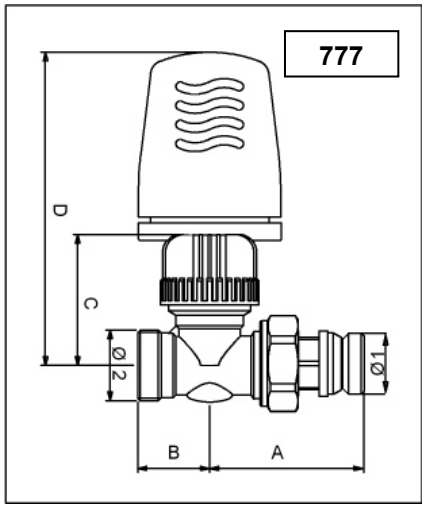


DIMENSIONING AND PART NUMBER

THERMOSTATIC VALVES - BRASS TUBE, MULTILAYER, PE-X

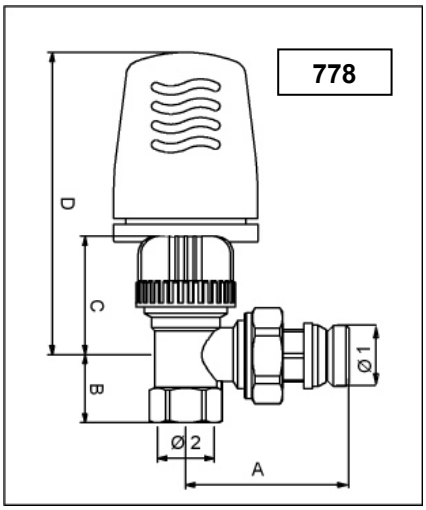


CODE	Ø1	Ø2	A	B	C	D
82776AD06	G1/2"	M24x1,5	51	24	40	107

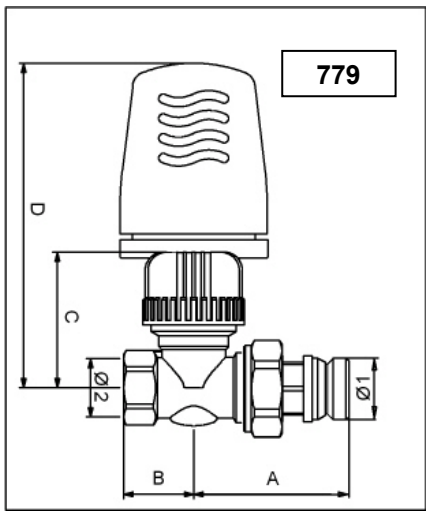


CODE	Ø1	Ø2	A	B	C	D
82777AD06	G1/2"	M24x1,5	48	25	45	111

THERMOSTATIC VALVES – IRON TUBE



CODE	Ø1	Ø2	A	B	C	D
82778AC06	G3/8"	G3/8"	52	21	40	107
82778AD06	G1/2"	G1/2"	55	23	40	107
82778AE06	G3/4"	G3/4"	61	25	40	107



CODE	Ø1	Ø2	A	B	C	D
82779AC06	G3/8"	G3/8"	50	23	44	111
82779AD06	G1/2"	G1/2"	52	24	44	111
82779AE06	G3/4"	G3/4"	58	25	45	111

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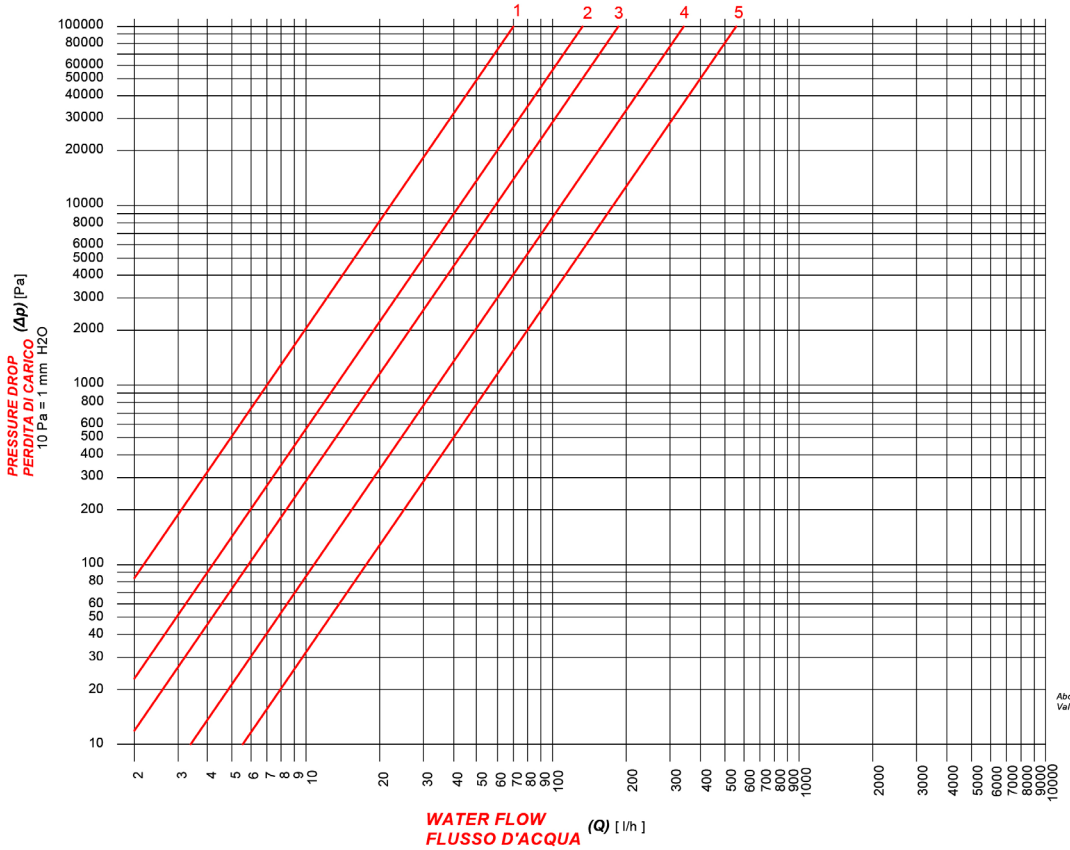
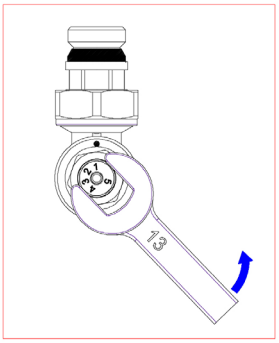
HYDRAULIC CHARACTERISTICS

Two-pipe valve with presetting Art.776-777-778-779 3/8"-1/2"
Valvole bitubo doppio regolaggio Art.776-777-778-779 3/8"-1/2"

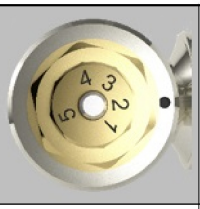
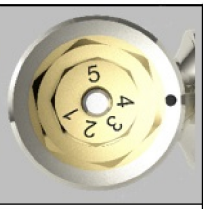
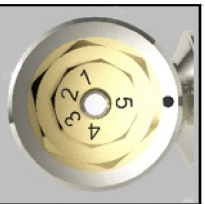
PRESSURE DROP DIAGRAM (S-2K)
DIAGRAMMA DELLE PERDITE DI CARICO (S-2K)





Setting	Kv [m³/h] S-2K	Kv [m³/h] S-1K
5	0,55	0,30
4	0,35	0,24
3	0,18	0,16
2	0,13	0,11
1	0,07	0,07

Above values referred to the radiator flow, with thermostatic head Art.1100
Valori riferiti al flusso nel radiatore, con testina termostatica Art.1100

Kvs [m³/h]					
3/8" straight/diritto	0,07	0,16	0,28	0,46	1,05
3/8" angled/squadra	0,07	0,16	0,28	0,46	1,35
1/2" straight/diritto	0,07	0,16	0,28	0,46	1,3
1/2" angled/squadra	0,07	0,16	0,28	0,46	1,45
3/4" straight/diritto	0,24	0,4	0,72	1,12	1,55
3/4" angled/squadra	0,24	0,32	0,46	0,62	1,81

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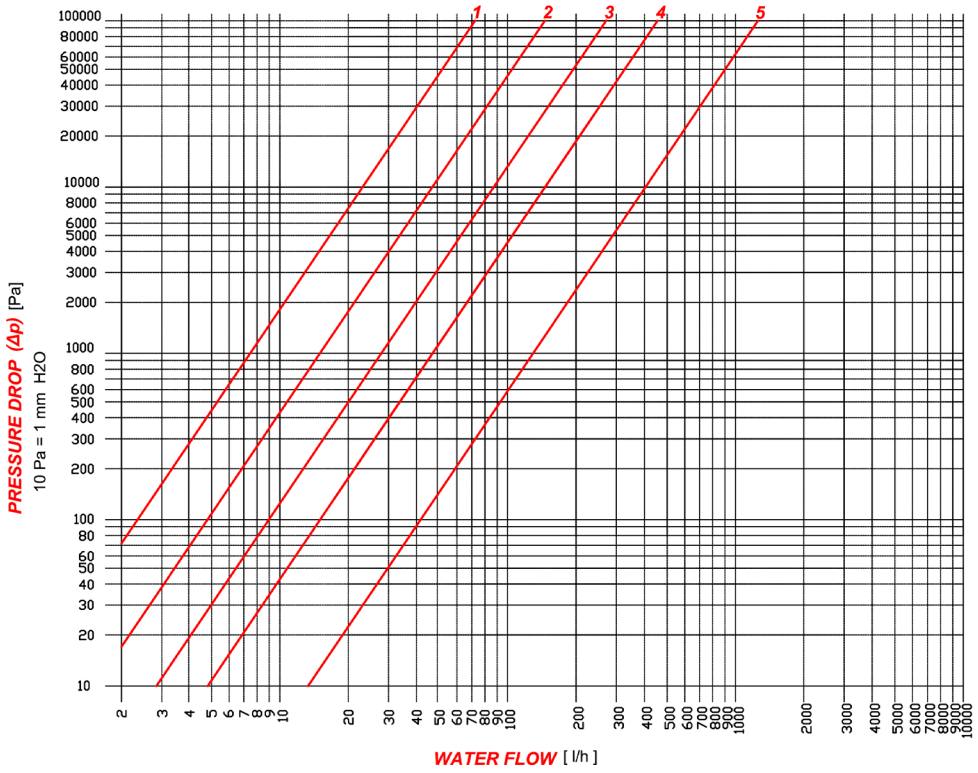
Angled thermostatic valve with pre-setting G $\frac{3}{8}$" - Art. 776-778

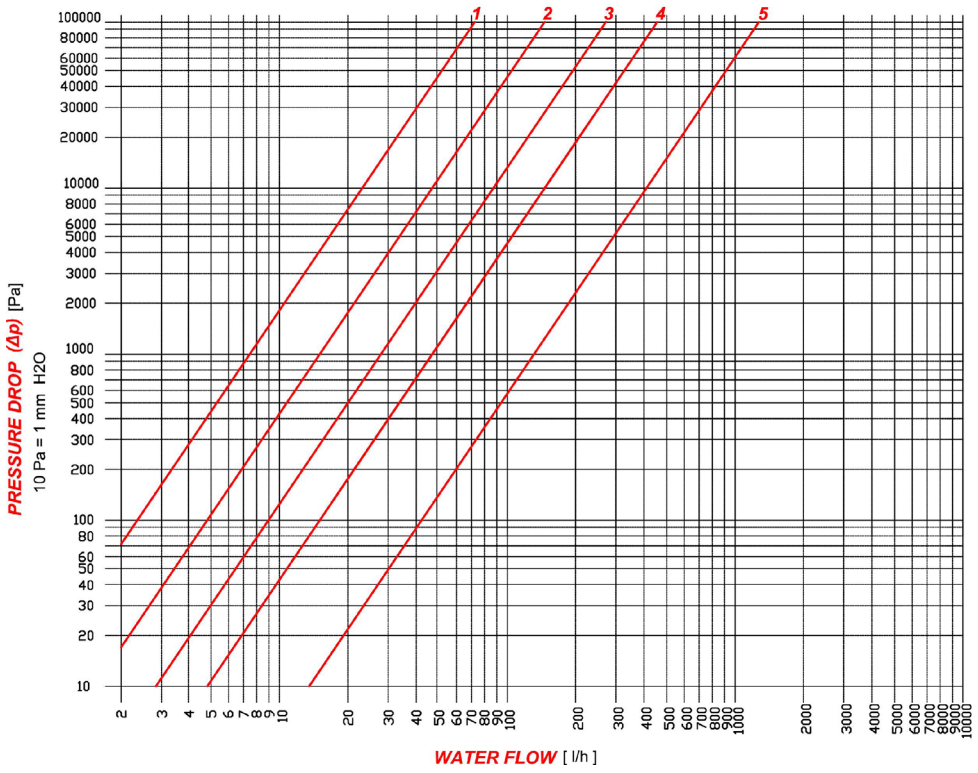
PRESSURE DROP DIAGRAM



Kv [m³/ h]	
1	0,07
2	0,16
3	0,28
4	0,46
5	1,35

Straight thermostatic valve with pre-setting G $\frac{1}{2}$" - Art. 777-779

PRESSURE DROP DIAGRAM



Kv [m³/ h]	
1	0,07
2	0,16
3	0,28
4	0,46
5	1,30

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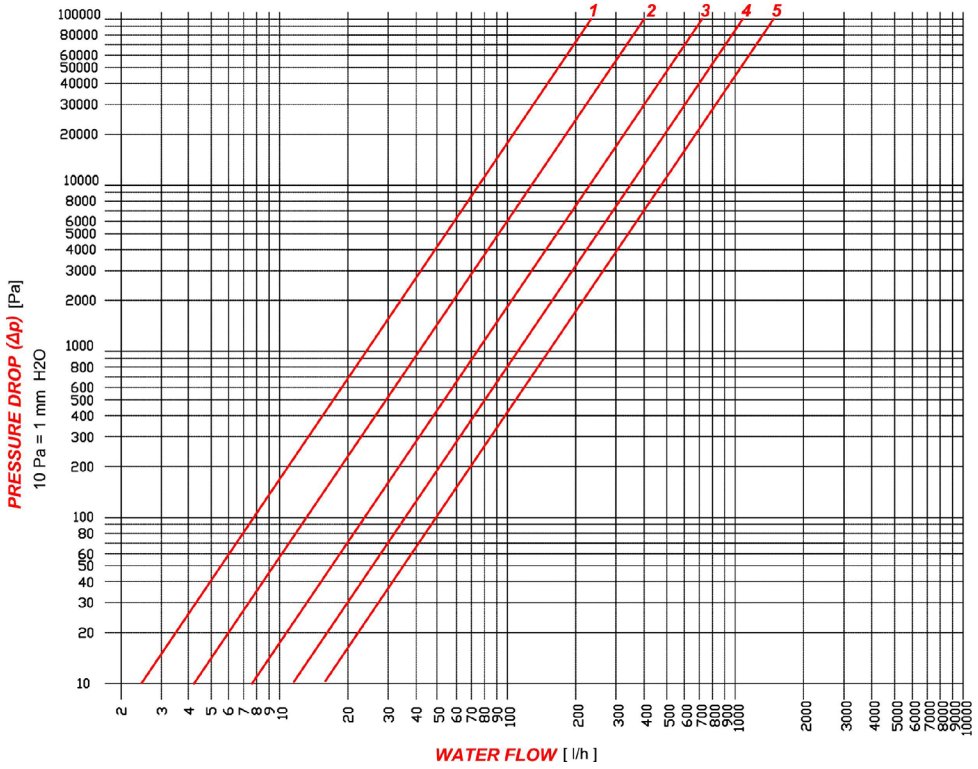
Straight thermostatic valve with pre-setting G ¾" - Art. 777-779

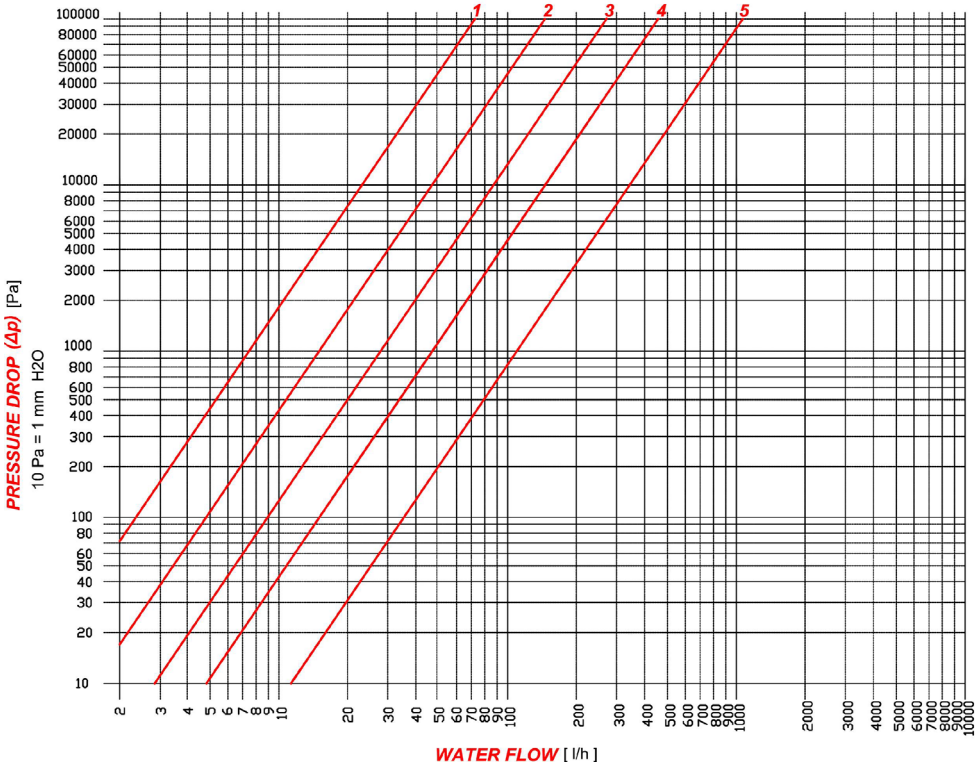
PRESSURE DROP DIAGRAM



Kv [m³/h]	
1	0,24
2	0,40
3	0,72
4	1,12
5	1,55

Straight thermostatic valve with pre-setting G ⅜" - Art. 777-779

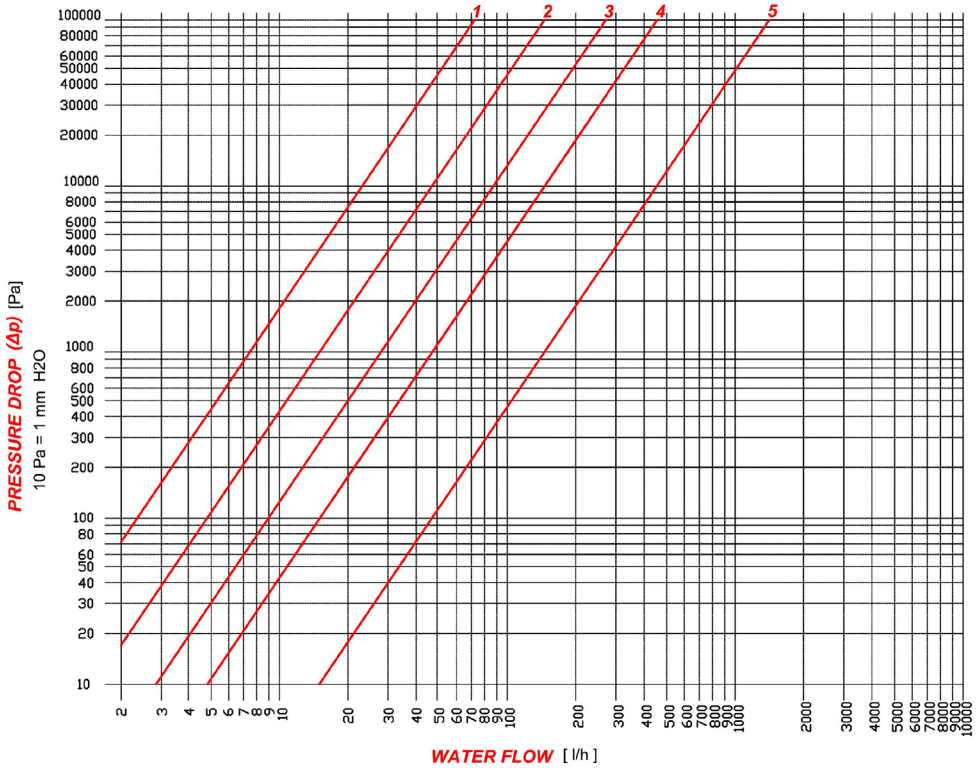
PRESSURE DROP DIAGRAM



Kv [m³/h]	
1	0,07
2	0,16
3	0,28
4	0,46
5	1,06

Angled thermostatic valve with pre-setting G $\frac{1}{2}$" - Art. 776-778

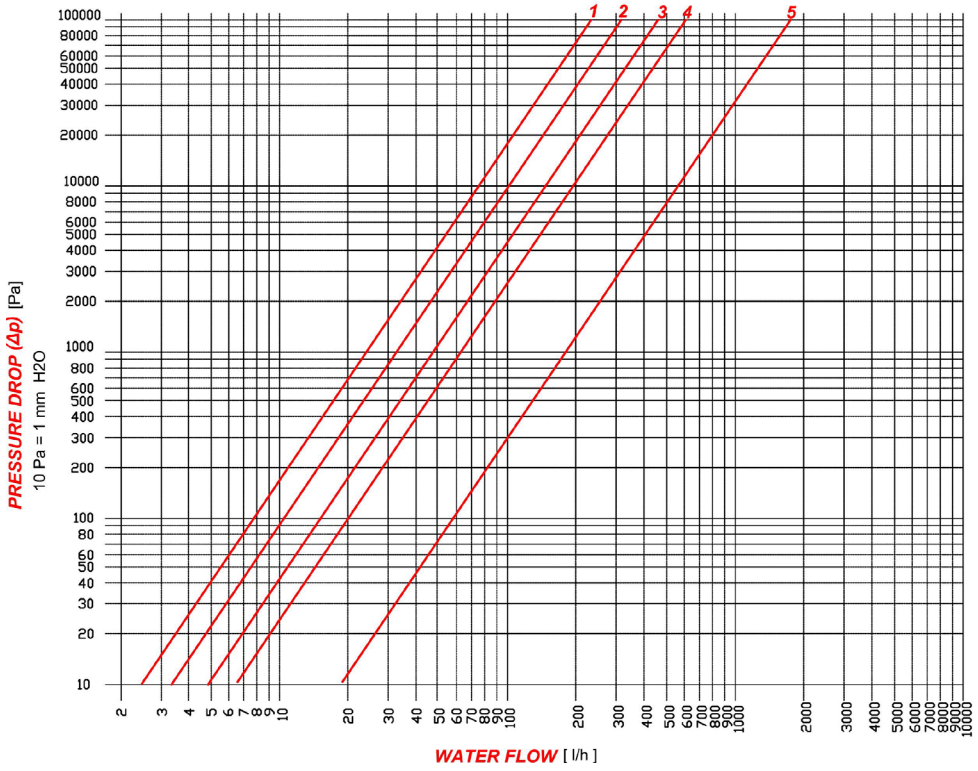
PRESSURE DROP DIAGRAM



Kv [m³/ h]	
1	0,07
2	0,16
3	0,28
4	0,46
5	1,45

Angled thermostatic valve with pre-setting G $\frac{3}{4}$" - Art. 776-778

PRESSURE DROP DIAGRAM



Kv [m³/ h]	
1	0,24
2	0,32
3	0,46
4	0,62
5	1,81