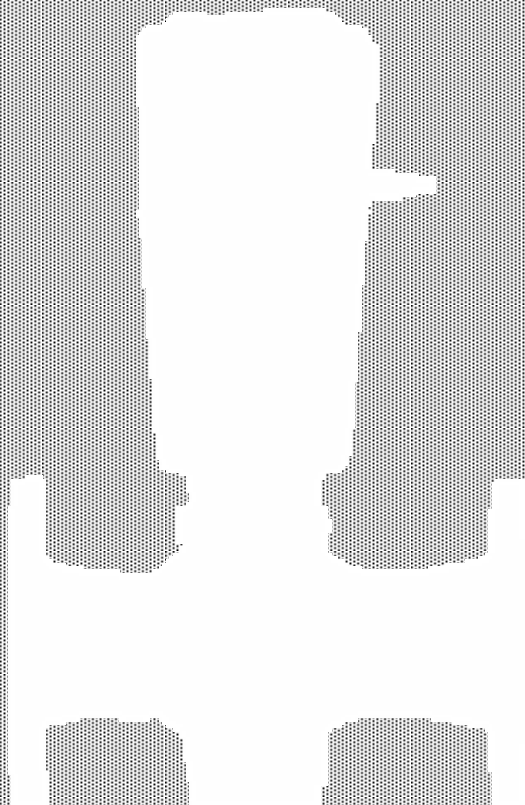




I N S T R U C T I O N S

For installing, starting and servicing the AT series
of temperature regulators





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1. GENERAL INFORMATION:

1.1 - RIGHT TO MAKE MODIFICATIONS AND "COPYRIGHT"

The regulations, standards, etc. mentioned in these operating instructions are based on the knowledge that was available when they were drawn up and are not subject to modification. Users are responsible for applying the latest versions of these.

The supplier reserves the right to make modifications and technical improvements to data and information whenever it sees fit. Under no circumstances may users require modifications or improvements to be made to valves that have already been delivered.

2. GUARANTEE

The scope and duration of the guarantee are indicated in the manufacturer's "General Conditions of Sale".

The applicable conditions are those that were in force at the moment of delivery.

Amongst other things, the guarantee does not cover damage to valves deriving from the following:

- ° Ignorance or non-observance of these operating instructions!
- ° Insufficiently trained fitters, operators or maintenance men.
- ° Normal wear and tear
- ° Incorrect or negligent use of the valves.

The manufacturer declines all liability for the following which are not covered by the guarantee:

- ° Non-observance of accident prevention regulations and/or safety legislation.
- ° Incorrect assembly, start-up or use
- ° Improper or incorrect use, inappropriate use or different working conditions from those agreed
- ° Users are solely liable for physical injury and/or damage to property if the above is not observed.

3. VALIDITY OF INSTRUCTIONS

These instructions refer to the "AT" series of self-operated temperature regulators :

AT/S1/D – Single seat, direct-acting

AT/S2/D – Double seat, direct-acting

AT/S1/R – Single seat, reverse-acting

AT/S2/R – Double seat, reverse-acting

AT/3V/M – Three-way mixing

AT/3V/DV – Three-way diverter





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4. PRODUCT SAFETY INDICATIONS AND BOX SYSTEM

If and where appropriate, safety warnings have been placed inside boxes in the margins of the pages of this manual.

These rectangular boxes are positioned vertically (as shown in the following examples) and contain four sections containing messages communicating:

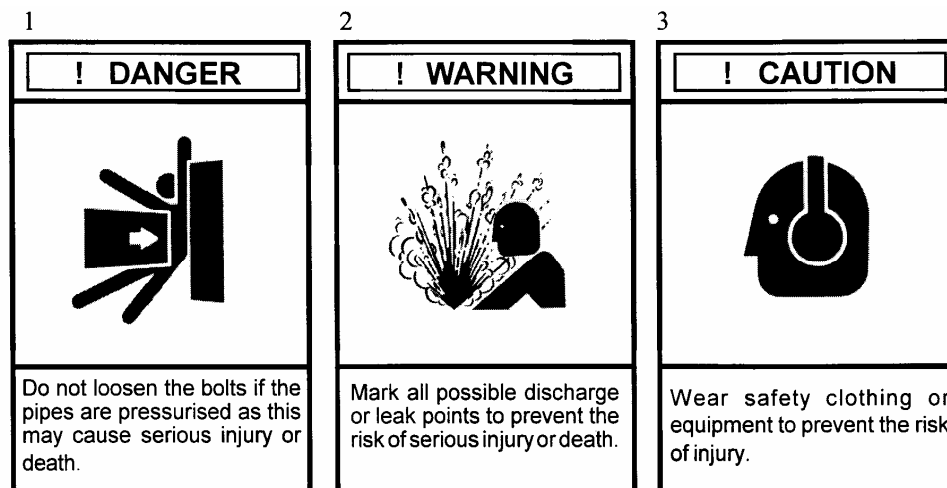
- The level of severity
- The nature of the risk
- The effects of the risk on people or products
- Instructions, if necessary, on how to avoid the risk

The top section contains a warning word (DANGER – WARNING – CAUTION - ATTENTION) which indicates the severity of the risk.

The central section contains a drawing indicating the nature of the risk and its possible effects on people and property. In some cases, the drawing may suggest what preventive measures can be taken, such as wearing safety clothing.

The bottom section may contain a message with instructions on how to avoid the risk. In the event of risks for people, the message may also contain a more precise definition of the risk and its effects on people.

- 1) **DANGER** – Immediate risk which will certainly cause serious injury or death.
- 2) **WARNING** – Risk or hazardous behaviour which may cause serious injury or death.
- 3) **CAUTION** – Risk or hazardous behaviour which may cause minor injury.





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5. SAFETY WARNINGS

Thorough maintenance operations and overhauls are important for the safe and reliable operation of all valves.

The service procedures recommended by CARRARO and described in this manual are effective methods for carrying out maintenance operations. Please note that this service manual contains various warning and caution notices which should be read carefully in order to minimise the risk of injury to people or the possibility of using incorrect work methods which may damage the valves or make them unsafe. It is important to realise, however, that these warnings cannot be exhaustive.

CARRARO is unable to know, assess and inform customers or users of all the conceivable methods of performing maintenance operations and all the risks deriving from the use of such methods.

Consequently, CARRARO has not even attempted to start such a task. Therefore, whoever uses a service method or piece of equipment which is not recommended by CARRARO must make sure that neither his own or other people's safety, nor valve safety and performance are jeopardised by the chosen method.

In case of doubt about the method used, please contact CARRARO.

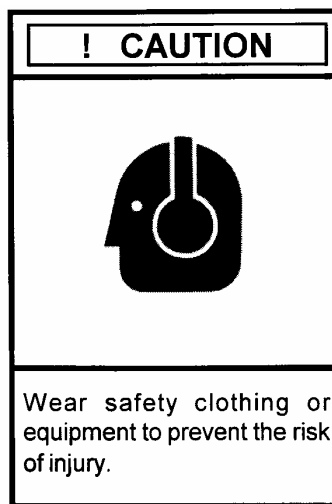
Testing, installing or dismantling the valves or accessories may cause you to come into contact with fluids at very high pressures or temperatures and/or corrosive or erosive, capable of generating potentially explosive atmospheres.

Therefore, take all safety precautions while testing, installing or dismantling the product; these include, wearing ear plugs, goggles and safety clothing, such as gloves, both in or near the work area.

Given the large number of conditions and circumstances that may arise while working on the products and the consequent risks deriving from the way this is done, CARRARO is unable to prevent all risks of injury to people and damage to property and can only help by asking you to take the utmost care and by providing the following safety suggestions.

Users of CARRARO products are responsible for training the staff that will use them.

It is most important for these people to acquire a thorough knowledge of the instructions referring to the product, especially those contained in this manual.






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6. SAFETY PRECAUTIONS

! DANGER




Decrease pressure and keep away from the discharge side when operating a valve in order to prevent serious injury or death.

! CAUTION



Wear suitable protection equipment in order to prevent injury.

! WARNING



Mark all possible discharge or leak points in order to prevent serious injury or death.

Always observe the current plant safety regulations together with the following indications:

° Wear safety clothing. Hot water can scald you and overheated steam is invisible.

° When dismantling a valve, wear safety clothing to prevent being sprayed by any process fluid that may have accumulated inside. Remember that this fluid may generate a potentially explosive mixture. Make sure the valve is isolated from any pressure source in the system before starting to dismantle it.

° Inspect/service the valves at least once a year.

° The outer surfaces of the valves reach the same temperature as that of the fluid flowing inside them. For this reason, when installing a valve in a potentially explosive atmosphere, make sure that the flashover temperature of the mixture surrounding the valve is safely above that of the fluid flowing inside the valve and do not allow inflammable powders to deposit on the outer surface of the valve.

° The system must be equipotential at the connection between the valve and the piping in order to prevent the accumulation of electrostatic electricity on the outer surfaces of the system that can act as an efficient flashover trigger in a potentially explosive atmosphere.

° Please consult CARRARO before working on valve parts.



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7. TRANSPORT, STORAGE AND HANDLING

Transport

Depending on their size, valves can be transported loose, packed in cardboard boxes or in wooden crates.

The valve ends are fitted with covers to prevent dirt from entering. Packs can be placed on pallets if required. Follow all and any indications written on the packaging.



CAUTION

Operators moving loads must take all necessary precautions to prevent accidents.

Storage

Keep valves in a dry and sheltered place. Only remove them from their crates or packaging immediately prior to installation.

Keep the end protectors and covers on until the last moment. Do not knock the valves, even when they are packed.

Whether packed or not, always keep valves upright, that is, never lying on their sides, in order to prevent distortion and damage to internal parts.

Handling

When unpacking a valve and removing the end protectors immediately prior to installation, take great care to make sure that foreign bodies do not enter the inlet and outlet holes while the valve is being connected.



CAUTION

When handling a valve, make sure the work area is kept clear in order to prevent injury to people and damage to property



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8. CHARACTERISTICS AND MARKINGS

Plate "A" attached to the regulator body indicates:

- SERIAL NUMBER OF THE REGULATOR

When requesting spare parts, always quote this number.

- DIAMETER OF THE REGULATOR AND THE CHARACTERISTICS OF THE PLUG

The number indicates the entry and exit diameter of the regulator and normally corresponds to the diameter of the seat.

For 1/2" single-seat regulators, the following 5 seat diameters are available:

A – diam. 1/4" seat for unprofiled plug

B – diam. 3/8" seat for unprofiled plug

C – diam. 1/4" seat for profiled plug

D – diam. 3/8" seat for profiled plug

E – diam. 1/2" seat for profiled plug

Plate "B" is attached to the frame (8) indicates:

- CALIBRATION OR ADJUSTMENT RANGE
- UPLINE AND DOWNLINE OPERATING PRESSURES

- DIRECT ACTION – The poppet stops the fluid from flowing when its temperature is higher than the calibrated value
- REVERSE ACTION – The poppet stops the fluid from flowing when its temperature is lower than the calibrated value

A GRADUATED PLATE is attached to the CALIBRATION INDEX side of the frame (8)

This scale shows the compression of the spring and therefore gives an approximate indication of the calibration.

For fine-tuning, read the required temperature on a thermometer and then turn the adjustment ring (10)

The MINIMUM TEMPERATURE OF THE FIELD OF REGULATION is indicated at the connection point of the capillary.

This number is characteristic of the SENSITIVE SYSTEM (Bellows-capillary-bulb)

All the regulators parts are interchangeable and therefore different SENSITIVE SYSTEMS can be mounted on every body (with frame), thus changing the calibration range of the regulator. (Also see: "REPLACING THE SENSITIVE SYSTEM AND SET SPRING")

The point connecting the capillary to the bulb is marked with a red dot;

This dot is very important when mounting the bulb and **MUST ALWAYS FACE UPWARDS.**



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9. INSTALLATION

See drawing Fig. 3 (installation examples)

9.1 INSTALLING THE REGULATOR AND FILTER (Fig. 3)

The regulator can be installed WITHOUT DISTINCTION above or below the bulb connector.

When installing the regulator, pay attention to the ARROW on the plate attached to the frame indicating the direction of FLOW.

It is always best to use the "S" filter to protect the seat and the plug of the regulator from possible damage by foreign bodies.

Cut the connector tubes to the right lengths and perfectly align them in order to prevent stress on the regulator body.

When CONTINUOUS OPERATION is required, install the three by-pass valves "X" "Y" "Z", as shown in fig. 1.

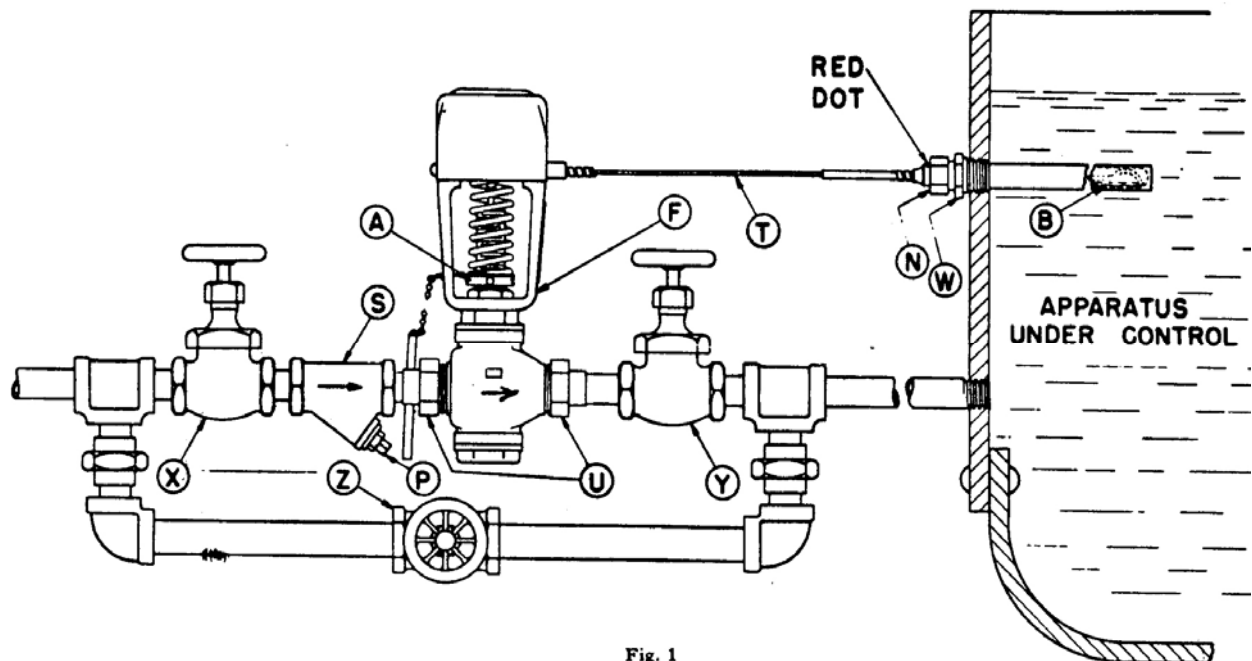


Fig. 1

9.2 INSTALLING THE SENSITIVE BULB

There are 2 types of standard bulb:

SMALL – diam. 15.8

LARGE – diam. 25.4

The STANDARD bulb (fig. 2 ref. 5) can be directly immersed into the fluid: in vessels, in open tanks, in drying chambers, etc..

For application examples, see fig. 3

Fitted with a UNION CONNECTION (fig. 2 ref. 6-7) it can be directly immersed in the fluid in pressurised tanks. Pressure must not exceed 17.5 atm with the small bulb and 8.4 atm with the large and extra-large bulb.

Fitted with a WELL ASSEMBLY (fig. 6), it can be emerged in tanks at higher pressures or in corrosive fluids. For application examples, see fig. 3



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The sensitive elements cannot be subject to temperatures higher than those indicated in tab. 1 below.

Tab. 1

SENSITIVE ELEMENT ASSEMBLY				
Type of SENSITIVE ELEMENT	Calibration range (°C)	Bulb diameter (mm)	Bulb length (mm)	Max. length of capillary (metres)
SBE 724 D	-25 ÷ 20	25,4	403	4,55
SBE 724 F	10 ÷ 60	25,4	403	3,05
SBE 724 H	20 ÷ 75	25,4	403	6,1
SBE 724 K	35 ÷ 90	25,4	403	6,1
SBE 724 M	55 ÷ 100	15,8	352	12,2
SBE 724 P	70 ÷ 125	15,8	352	12,2
SBE 724 R	110 ÷ 170	15,8	352	12,2
SBE 724 T	140 ÷ 210	15,8	352	12,2
SBE 724 V	165 ÷ 225	15,8	352	12,2

For use with particularly aggressive chemicals, the POLYVINYL-lined STANDARD sensitive system is available.

For this type of bulb, the permitted temperature varies from a minimum of 35°C to a maximum of 100°C.

In an environment subject to alternate heating and cooling, the temperature can never **the same everywhere**.

Therefore, the installation point of the bulb must be chosen so that it represents the temperature requiring regulation as well as possible.

When regulating the temperature of **large vessels**, install the bulb near the heating element; if the bulb is installed far away from the heating element, in fact, hotter areas can be generated near the heating element.

BULBS WITHOUT UNION CONNECTION, that is, STANDARD BULBS, can be installed vertically with the capillary facing upwards, and horizontally; in this case **incline the bulb** so that the free end is **lower** than the end to which the capillary is connected.

The bulb must be fitted with bent pins that allow it to expand freely.

Bulbs with union connections or well assemblies (fig. 2 ref. 5-6-7) must be immersed in the fluid they are required to regulate up to the lengths indicated in tab. 2.

If the bulb is not emerged far enough, BAD REGULATIONS are obtained.

If the well assembly is required, the film of air between the BULB and the WELL ASSEMBLY hinders heat transmission.

To improve regulation speed, place a mixture of GRAPHITE AND GLYCERINE, or SILICON GREASE for high temperatures.





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MOUNTING BULBS WITH UNION CONNECTION OR WELL ASSEMBLY.

Loosen the nut "N" of the connection joint (or well assembly) "W" using two wrenches (see fig. 1).

Pull off the complete connection (or well assembly) from the bulb.

Secure the "W" connector in its seat. The threading is conical because it is the only type that can guarantee a seal.

If it is not possible to make a conical thread according to ANSI B2-1NPT, we supply a flange for welding with a conically threaded hole NPT (fig. 2 ref. 7)

Immerse the bulb up to the indicated length (tab. 2)

Turn the bulb until the red dot is facing upwards.

Tighten the nut "N".

10. STARTING UP AND CALIBRATING THE TEMPERATURE REGULATOR

To calibrate the temperature regulator, immerge a thermometer directly, or with a well assembly, into the relevant fluid.

Use tab. 1 to roughly calibrate the regulator.

Allow the fluid flow and read off the regulated temperature on the thermometer. Read the temperature again a few minutes after thermal balance is obtained.

Then, using the plug (21) fig. 4-5 supplied with the regulator, turn the set ring (10) fig. 4-5 by fractions of a turn until the required temperature is achieved, bearing in mind that the temperature will INCREASE when the spring is loaded and DECREASE when it is released.

Wait for the temperature to stabilise between one movement and the next.

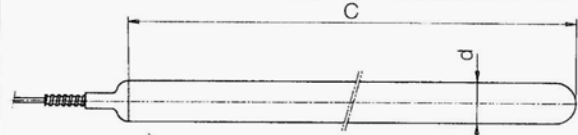
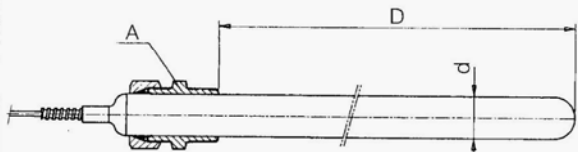

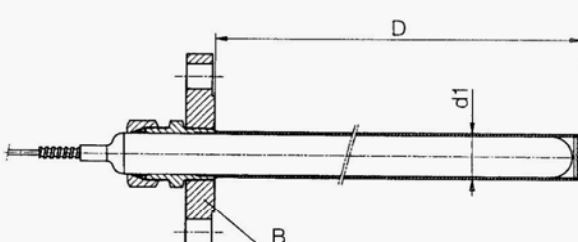




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Fig. 2

Rif./Ref.	Tipo/Type	Applicazioni/Applications
4		Bulbo standard - applicazione per vasche aperte <i>Standard bulb - used on open vessels</i>
5		Bulbo con giunto di collegamento - applicazione su apparecchi a pressione <i>Bulb with union connection - used on pressure vessels</i>
6		Bulbo con pozzetto filettato - applicazione su apparecchi a pressione elevata - possibilità di smontare il bulbo senza svuotare l'impianto <i>Bulb with screwed well assembly - used on high pressure vessels - in this case it is possible to remove the bulb without emptying the vessel</i>
7		Bulbo con pozzetto flangiato - applicazione su apparecchi a pressione elevata - possibilità di smontare il bulbo senza svuotare l'impianto <i>Bulb with flanged well assembly - used on very high pressure vessels - also in this case it is possible to remove the bulb without emptying the vessel</i>

I pozzetti rif. 6-7 sono realizzabili anche ricavati da barra con lunghezza massima di immersione di 500 mm. per pressioni massime di 160 bar per i bulbi piccoli e 100 bar per i bulbi grandi.

The well assemblies ref. 6-7 can be manufactured also from bar with a maximum length of 500 m/m for a maximum pressure of 160 bar for small bulbs, and 100 bar for big bulbs.

Tipo bulbo Bulb type	d	d1	A	C	D	B	Pressione massima bar Max pressure in bar			
							Rif./Ref. 4-5	Rif./Ref. 6-7		
								20°C	95°C	205°C
Piccolo Small	15,8	20	3/4 NPT	340	267	ND40 NP16÷64 ANSI 150÷600RF	17,5	84	77	70
Grande Big	25,4	29	1" NPT	390	318	ND40 NP16÷64 ANSI 150÷600RF	8,4	40	36	33

DEFINIZIONE BULBI

- 4 - Bulbo senza giunto e senza pozzetto
- 5 - Con giunto in AISI 316
- 6 - Con pozzetto standard in AISI 316
- 7 - Con pozzetto speciale

BULB DEFINITION

- 4 - Bulb without connection and without thermowell
- 5 - Bulb with AISI 316 union connection
- 6 - Bulb with standard AISI 316 thermowell
- 7 - Bulb with special thermowell

Tab. 2



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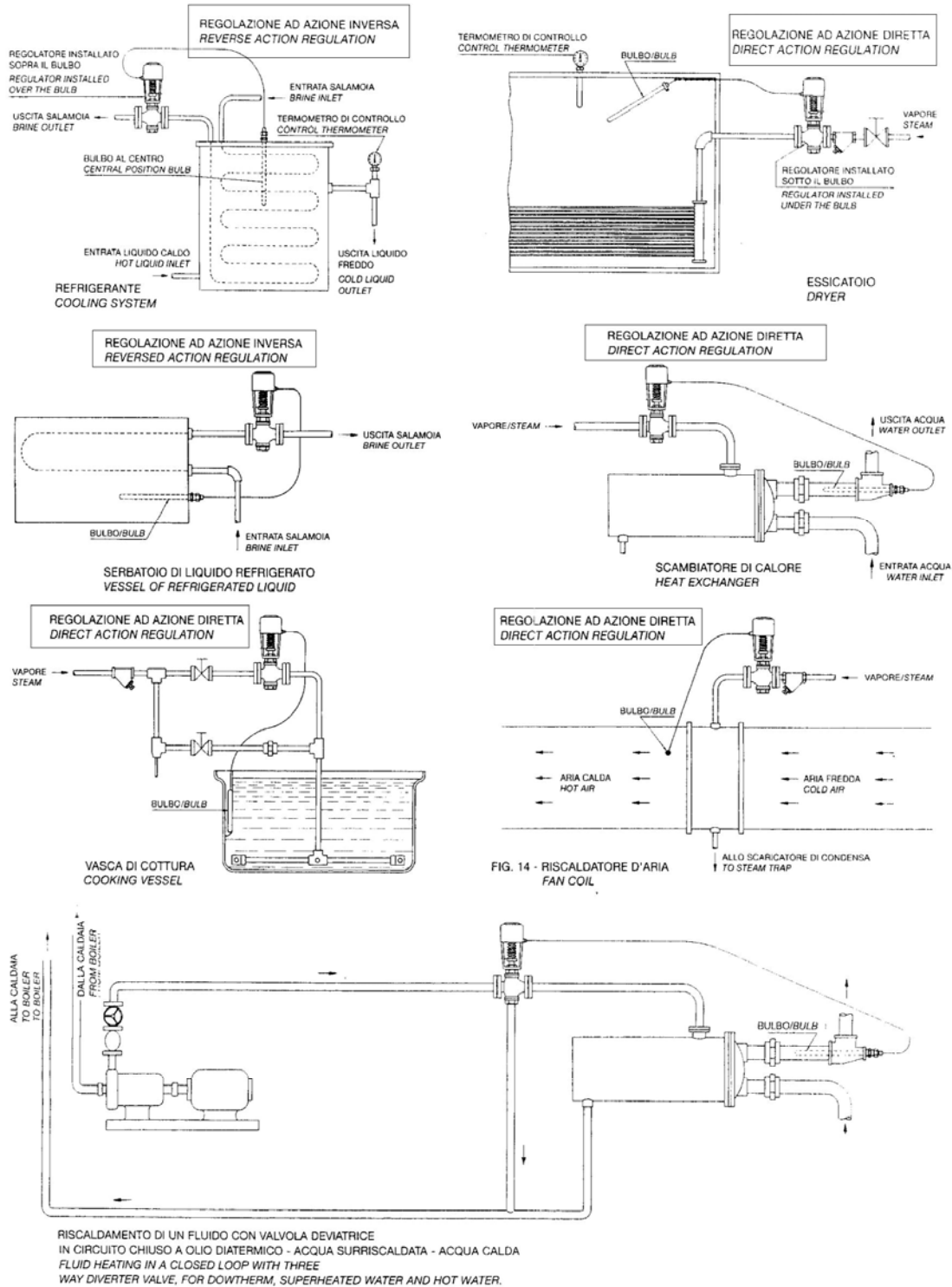
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11. DRAWINGS AND INSTALLATION EXAMPLES (Fig. 3)





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12 SERVICING THE TEMPERATURE REGULATOR

IMPORTANT: The stem of the valve has no packing gland.

NEVER TURN THE VALVE STEM; the seal is achieved by a bellows and therefore **EVEN THE SLIGHTEST ROTATION OF THE VALVE STEM WOULD IRREPARABLY DAMAGE THE BELLOWS.**

Vent FILTER "S" at regular intervals by removing the plug "P". (see fig. 1).

To perform this operation rapidly, install a valve instead of the plug "P".

Regularly check the mesh of the filter "S" to make sure it is clean and replace if necessary.

12.1 REPLACING THE SENSITIVE SYSTEM AND SET SPRING

For temperature regulators with diameters ranging from 1/2" to 2", all the sensitive systems (bellows-capillary-bulb) are **INTERCHANGEABLE**.

There are also 4 types of springs for covering different calibration ranges.

Tab. 3 below shows the various ranges.

Tab. 3

Copper-plated SPRING		Silver-plated SPRING	
IDEAL calibration point (°C)	SMALL calibration point (°C)	IDEAL calibration point (°C)	LARGE calibration point (°C)
-2	-25 ÷ 10	5	-25 ÷ 20
33	10 ÷ 45	43	10 ÷ 60
47	20 ÷ 60	57	20 ÷ 75
58	35 ÷ 70	72	35 ÷ 90
140	110 ÷ 155	150	110 ÷ 170
173	140 ÷ 190	187	140 ÷ 210
188	165 ÷ 200	205	165 ÷ 225
Red SPRING		Blue SPRING	
IDEAL calibration point (°C)	SMALL calibration point (°C)	IDEAL calibration point (°C)	LARGE calibration point (°C)
75	55 ÷ 85	85	55 ÷ 100
95	70 ÷ 110	103	70 ÷ 125

12.2 REPLACING THE SENSITIVE SYSTEM

When replacing the sensitive system there are two possibilities:

Sensitive systems with minimum temperature in the calibration range LOWER than 45°C

Sensitive systems with minimum temperature in the calibration range HIGHER than 45°C

While no special operations are required in the 2nd case, in the 1st case the sensitive element must be dismantled and mounted bearing in mind the following:

At ambient temperature, the pressure of the steam inside the sensitive system (BULB+CAPILLARY+BELLOWS) is too high to allow the frame to be dismantled (or the piece of wood inside the bellows to be removed).

In these conditions, dismantling the frame or removing the piece of wood would irreparably damage the bellows.

To reduce the pressure in the sensitive system, REDUCE the temperature of the entire sensitive system, as specified in tab. 4.





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Tab. 4

Sensitive systems with minimum temperature in the calibration range °C	Cool the sensitive system to °C	Suggested cooling systems
35	10 or lower	Tap water mixed with ice
20	0 or lower	Ice crushed with water
10	-12 or lower	Ice crushed with salt
-25	-37 or lower	Alcohol and dry ice

Leave the entire sensitive system in the cooling bath for 15 minutes before removing it from the frame, or first remove the piece of wood from the bellows.

To dismount the sensitive element, prepare a 60 mm long piece of wood with a diameter of 35-38 mm and two 100 mm long steel pins with a diameter of 4 mm. After dismounting the sensitive element, place the piece of wood inside the bellows and push the two pins through the holes connecting it to the frame of the bellows box in order to keep the piece of wood inside the bellows.

To prevent the pins from coming out, thread the two ends and tighten the related nuts.

Dismount and mount the bellows as FAST as possible as soon as they have been removed from the bath in order to prevent the temperature from rising.

ALWAYS KEEP THE BULB IN THE COOLING BATH until the bellows have been fixed to the frame, or after mounting the piece of wood inside the bellows with the related pins.

AFTER DOING THE ABOVE, THE SENSITIVE SYSTEM CAN HEAT UP WITHOUT DANGER OF DAMAGE.

12.3 DISMOUNTING:

1. Fully lower the set RING (10) fig. 4-5 using the **PIN** in order to eliminate the compressive force of the spring.
2. Remove the **SCREWS** connecting the bellows box to the frame (8)
3. Remove the **SENSITIVE SYSTEM**
4. Make sure the **spring** is the right one for the required calibration range (see tab. 3).
5. Install the new SENSITIVE SYSTEM and proceed in reverse order.

12.4 REPLACING THE SPRING:

Proceed as in points 1/2/3 above.

4. Remove the RS4 SEEGER ring (13).
5. Remove the WASHER, disk and SPRING
6. Replace the spring

VERY IMPORTANT:

When changing the spring, the load limiting spring box is released.

The stroke of the valve is very accurately calibrated in the workshop by screwing the load limiting spring box onto the valve stem.

The valve stroke is extremely important in temperature regulators.

ALTERING THE VALVE STROKE MEANS COMPROMISING THE PERFORMANCE OF THE REGULATOR.

Never screw or unscrew the load limiting spring box on the rod, otherwise the bellows may break.



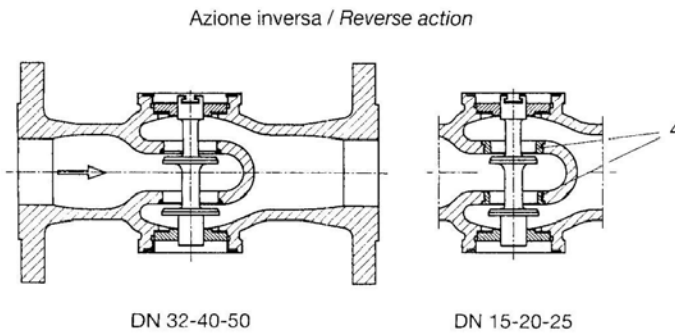
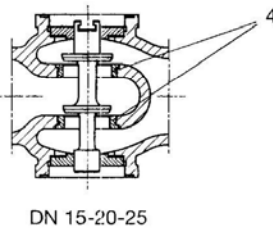
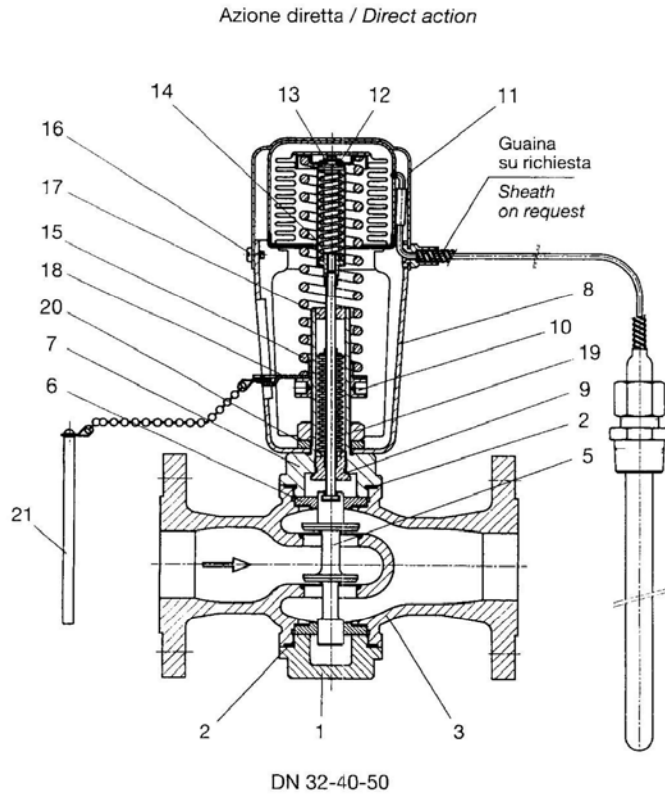


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13. CROSS-SECTION DRAWINGS OF THE TEMPERATURE REGULATORS

13.1 Cross-section drawing AT/S2/D - AT/S2/R (Fig. 4)



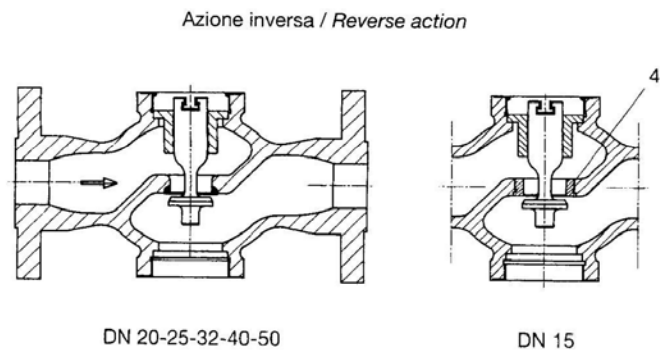
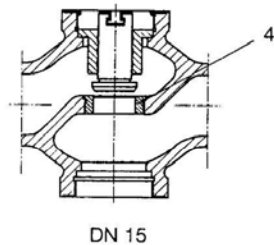
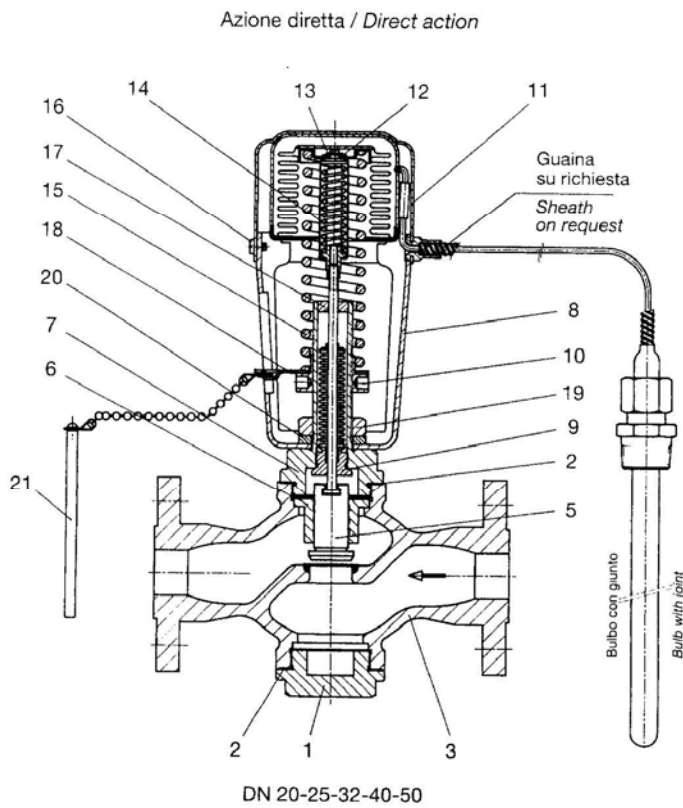
- | | |
|---|---|
| <ul style="list-style-type: none"> 1 Tappo per corpo valvola
<i>Valve body cover</i> *2 Guarnizione
<i>Gasket</i> 3 Corpo valvola
<i>Valve body</i> 4 Sede
<i>Seat</i> *5 Tappo di regolazione
<i>Plug</i> *6 Guida tappo di regolazione
<i>Plug guide</i> 7 Manicotto
<i>Sleeve</i> 8 Incastellatura
<i>Frame</i> *9 Asta soffietto
<i>Stem with bellows</i> 10 Anello regolazione molla
<i>Spring adjusting ring</i> *11 Gruppo elemento sensibile
<i>Sensitive element assembly</i> 12 Rondella
<i>Washer</i> 13 Anello "Seeger"
<i>"Seeger" ring</i> 14 Gruppo limitatore di carico
<i>Load limiting device assembly</i> 15 Molla di taratura
<i>Set spring</i> 16 Vite
<i>Screw</i> 17 Bussola guida asta
<i>Stem guide bushing</i> 18 Indicatore compressione molla
<i>Spring adjusting pointer</i> 19 Dado bloccaggio incastellatura
<i>Frame nut</i> 20 Rondella
<i>Washer</i> 21 Spina regolazione molla
<i>Adjusting pin</i> | <p style="text-align: center;">Soffietto
Bulbo + Capillare
Bellows
Bulb + Capillary</p> |
|---|---|
- * Ricambi consigliati / Recommended spare parts



I N S T R U C T I O N S

For installing, starting and servicing the AT series of temperature regulators

13.2 Cross-section drawing AT/S1/D - AT/S1/R (Fig. 5)



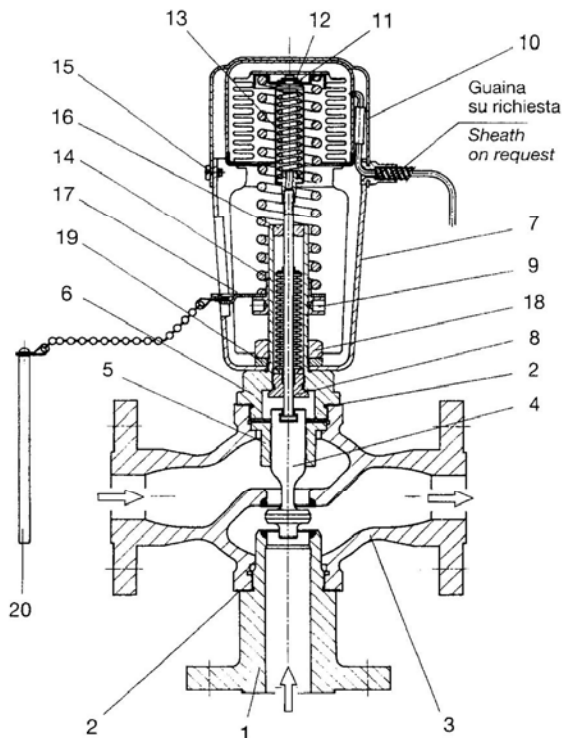
- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Tappo per corpo valvola
Valve body cover *2 Guarnizione
Gasket 3 Corpo valvola
Valve body 4 Sede
Seat *5 Tappo di regolazione
Plug *6 Guida tappo di regolazione
Plug guide 7 Manicotto
Sleeve 8 Incastellatura
Frame *9 Asta soffiutto
Stem with bellows 10 Anello regolazione molla
Spring adjusting ring *11 Gruppo elemento
sensibile
Sensitive element
assembly 12 Rondella
Washer 13 Anello "Seeger"
"Seeger" ring 14 Gruppo limitatore di carico
Load limiting device assembly 15 Molla di taratura
Set spring 16 Vite
Screw 17 Bussola guida asta
Stem guide bushing 18 Indicatore compressione molla
Spring adjusting pointer 19 Dado bloccaggio incastellatura
Frame nut 20 Rondella
Washer 21 Spina regolazione molla
Adjusting pin | <ul style="list-style-type: none"> Soffiutto
Bulbo + Capillare
Bellows
Bulb + Capillary |
|--|--|
- * Ricambi consigliati / Recommended spare parts



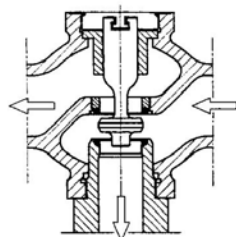
I N S T R U C T I O N S

For installing, starting and servicing the AT series of temperature regulators

13.3 Cross-section drawing AT/3V (Fig. 6)



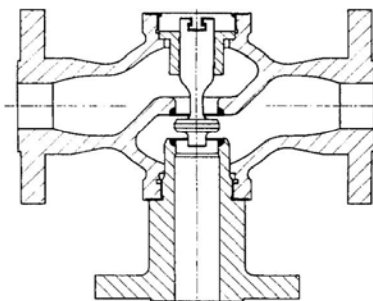
Miscelatrice / Mixing valve



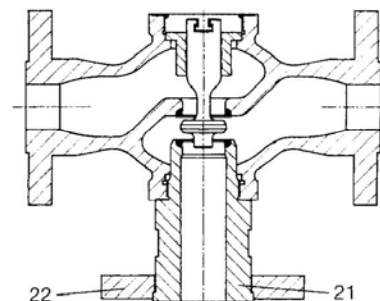
Deviatrica / Diverter

- | | | |
|-----|---|---|
| 1 | Terza via / Third way body | |
| *2 | Guarnizione / Gasket | |
| 3 | Corpo valvola / Valve body | |
| *4 | Tappo di regolazione / Plug | |
| *5 | Guida tappo di regolazione / Plug guide | |
| 6 | Manicotto / Sleeve | |
| 7 | Incastellatura / Frame | |
| *8 | Asta soffietto / Stem with bellows | |
| 9 | Anello regolazione molla
Spring adjusting ring | |
| *10 | Gruppo elemento
sensibile
Sensitive element
assembly | Soffietto
Bulbo + Capillare
Bellows
Bulb + Capillary |
| 11 | Rondella / Washer | |
| 12 | Anello "Seeger" / "Seeger" ring | |
| 13 | Gruppo limitatore di carico
Load limiting device assembly | |
| 14 | Molla di taratura / Set spring | |
| 15 | Vite
Screw | |
| 16 | Bussola guida asta
Stem guide bushing | |
| 17 | Indicatore compressione molla
Spring adjusting pointer | |
| 18 | Dado bloccaggio incastellatura
Frame nut | |
| 19 | Rondella / Washer | |
| 20 | Spina regolazione molla
Adjusting pin | |
| 21 | Bocchello / End connection | |
| 22 | Flangia slip-on / Slip-on flange | |

* Ricambi consigliati / Recommended spare parts



Azione - L'aumento della temperatura regolata provoca la chiusura della terza via
Action - The increase in controlled temperature cause third way closing



Esecuzione con flangia tipo slip-on su terza via
Slip-on companion flange on third way



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For installing, starting and servicing the AT series of temperature regulators

14. REPAIRS

14.1 If it is not possible to eliminate the problems, send faulty valves to the supplier/manufacturer, together with a description of the problem.

14.2 To receive spare parts or information, always quote the series number shown on the rating plate attached to the valve or punched on the outer surface of the flanges.

14.3 Rating plate (example)

○ Type of valve ○ Series n° Ends Cal.....Bar..... Q.....Mc/h Fluido.....Temp..... <div style="text-align: center; margin-top: 10px;"> CARRARO tel.02/269912.1 </div>
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14.4 To ensure the valves treated in this manual work correctly, they should be serviced by Carraro engineers or by Carraro-authorized Service Centres using original spare parts.



CAUTION

**The maker declines all liability for modifications to the product
or operations that are not contemplated in this manual.**