

VERNET S.A.  
21/27 Route d'Arpajon  
BP31 – OLLAINVILLE  
91291 ARPAJON Cedex  
France  
Tel:33(0)1 69 26 82 82  
Fax:33(0)1 60 83 03 03

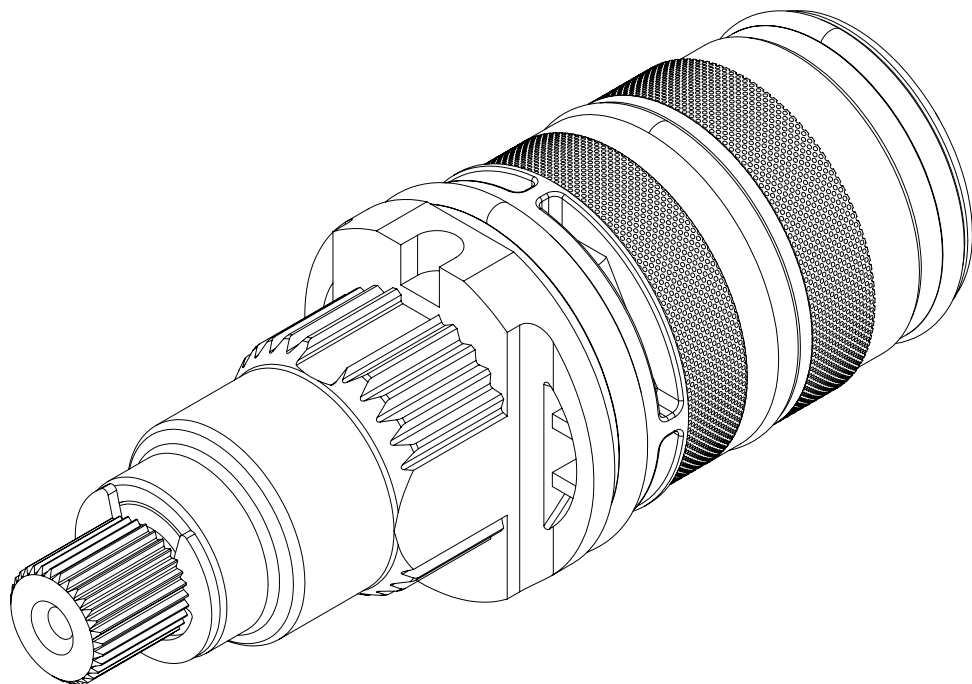


# Vernet

## TECHNICAL INSTRUCTIONS

NT 003

### Product : CA43 CARTRIDGES



Index : G

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Written by:	<i>CM</i>
Christian Macé	
Approved by:	<i>GLC</i>
Gérard.Le Clanche	

## SUMMARY

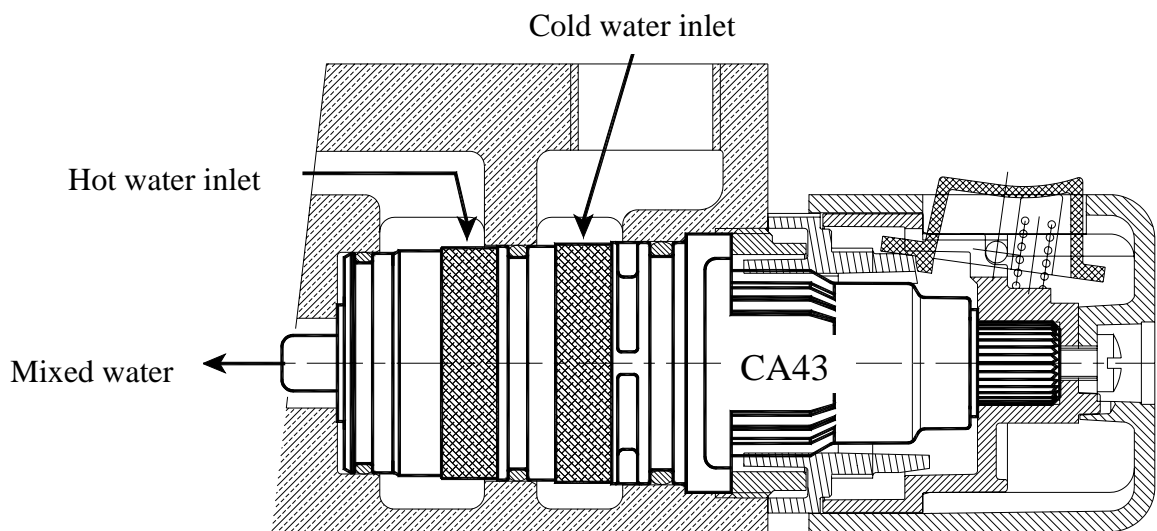
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## 1- PURPOSE

This document is intended to provide assistance for integrating the VERNET CA43 thermostatic cartridge into mixing valves, taps, faucets and other sanitary and heating applications.

It contains the technical information necessary for this integration, so as to obtain satisfactory performance characteristics from the valve etc.



## **2-TECHNICAL CHARACTERISTICS**

### **2.1 Materials**

The CA43 cartridge consists mainly of high-technology thermoplastic polymers providing dimensional stability and low adherence of calcium and other deposits. The other parts are brass parts, EPDM and NBR elastomeric seals and stainless steel springs.

All these materials have certification for use with drinkable water:ACS(France), WRAS(UK), NSF61(USA) or KTW(Germany) .This allows certification of the customer's end product .

The CA43 cartridge has received full ACS certification (France) , see certificate p20.

### **2.2 Different types of cartridges**

VERNET has developed several variants of the CA43 cartridge based upon the same body (same geometry and materials) , see table 1.

The variants are based on :

- flow rate
- the regulation (ability to pass standards )
- the hot water shut-off method : plastic to plastic (standard shut-off) or plastic to rubber “soft seat” ( improved shut-off).
- the spindle : standard or specific .

This range of cartridges provides the best compromise between flow rate and regulation.

It has been optimized by the technical characteristics of the thermostatic element especially developed for these cartridges and by the advanced design of the regulating components.

In addition the cartridges can be supplied with custom features such as pre-set temperature, special markings etc.

The part number comprises :

- the cartridge family “CA43 “
- the variant type (see table 1) e.g. “XB”
- the custom code e.g.” –01”

Other variants of the CA43 cartridge can be developed for specific customer needs such as a specific spindle, a specific thermal regulation curve , based on the CA43 types shown in table1 .

**Table 1 : CA43 variants**

CA43 type	soft seat	Suitable for Regulation standard (see standard legend below)	Cartridge flow factor		Valve flow rate				
					pressure	0.2bar	3 bar	3bar	45psi (3.1bar)
					Test method	NHS DO8 LP	NF <sub>shower</sub> (A resistance)	NF bath (C resistance)	ASSE (free outlet)
					Vernet test body	T ¾" E5933	Bar ½" 6733	Bar ½" 6733	T ¾" E5933
<b>CA43</b>	no	NF, ASSE	1.4	1.6		7.5 l/min	12 l/min	20 l/min	38 l/min (10 gpm)
<b>CA43XB</b>	YES	D08, ASSE	1.8	2.1		9 l/min	12.5 l/min	21 l/min	49.2 l/min (13 gpm)
<b>CA43L</b>	no	ASSE*	2.1	2.4		10 l/min	13 l/min	21.5 l/min	57 l/min (15 gpm)
<b>CA43G</b>	YES	D08 , ASSE*	2.1	2.4		10 l/min	13 l/min	21.5 l/min	57 l/min (15 gpm)
<b>CA43PB</b>	YES	None	2.8	3.2		14 l/min	13.5 l/min	22.5 l/min	72 l/min (19 gpm)
<b>CA43N</b>	no	None	4.0	3.4		18 l/min	14 l/min	23 l/min	88 l/min (23 gpm)

Flow factor and flow rates tolerance : ±10%.

Temperature for flow measurement : 38°C

All these results are from tests carried out with specific VERNET test bodies, they must be verified with the specific customer faucet . valve etc.

Regulation standard legend :

- \* : *Passes the standard under specific conditions only*
- NF : *French standard NF EN 1111 (marque NF077)*
- ASSE : *American standard ASSE 1016*
- D08 : *British standard NHS DO8*

### **2.3 Regulation**

The CA43 cartridges allow the mixing valve to pass the standard depending on the type as shown in Table 1, if certain design parameters are respected - See § 3.2 : “Installation in the mixing valve body” – Please, ask VERNET R&D Department for more explanation.

See the curves display angles/temperature page 7 to 9.

The anti-scalding function (hot water isolation in case of cold water failure) is checked 100% in the manufacturing process.

The CA43 cartridge can be set up to 70°C for disinfection operations .

### **2.4 Filters**

The cartridge CA43 are equipped with stainless steel filters with a mesh of 0.4 mm on hot and cold inlet.

### **2.5 Control torque**

0.5N.m maximum , measured at a pressure of 4 bar

### **2.6 Leak tightness :**

16 bar

### **2.7 Water hammer :**

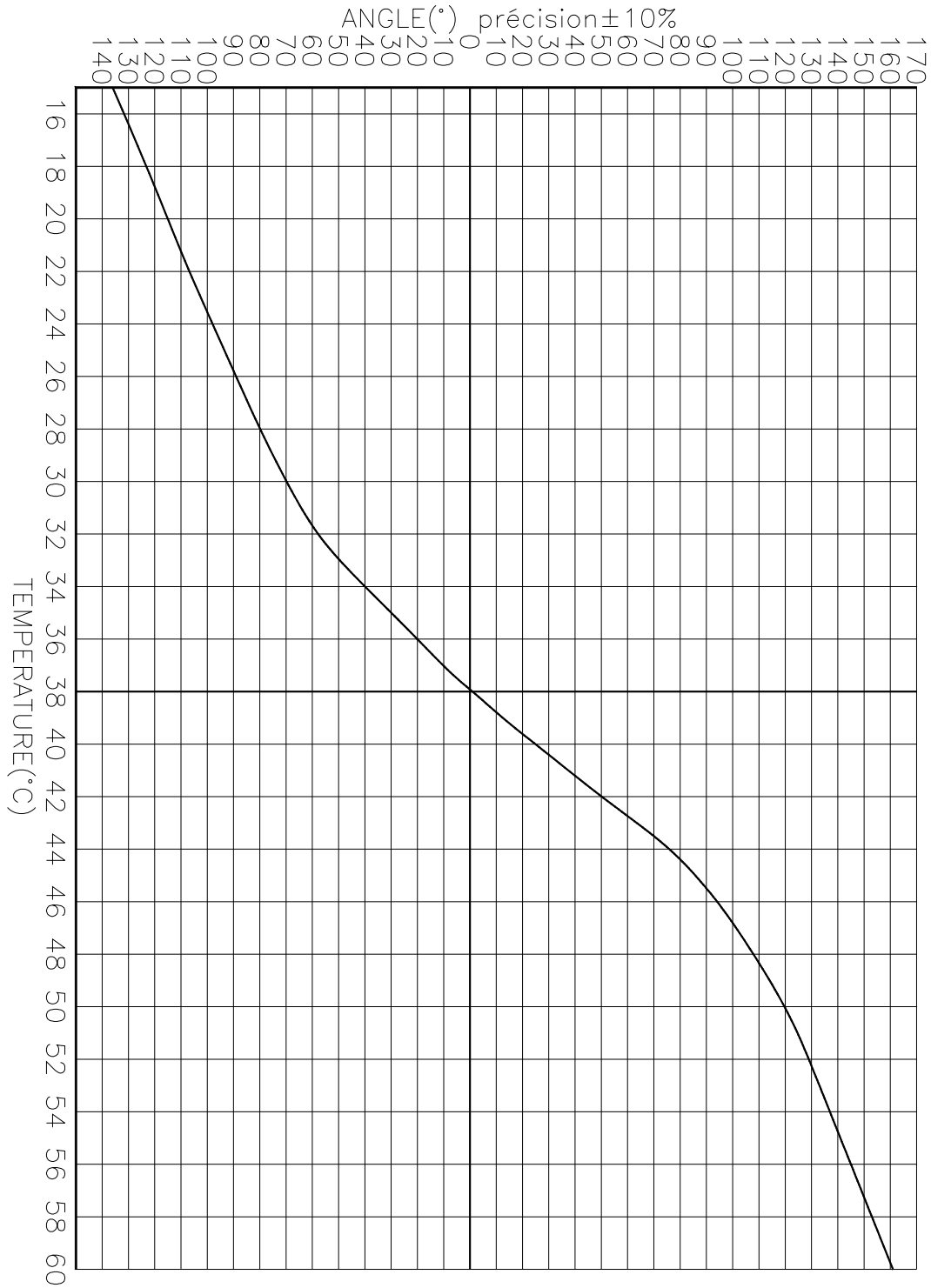
100 cycles 8bar/50bar

**DISPLAY ANGLES/TEMPERATURE : CA 43**

**(applies only to standard cartridges with temperature range 15-60°C)**

**Inlet water temperatures: 15°C and 65°C**

**P = 3 bar**

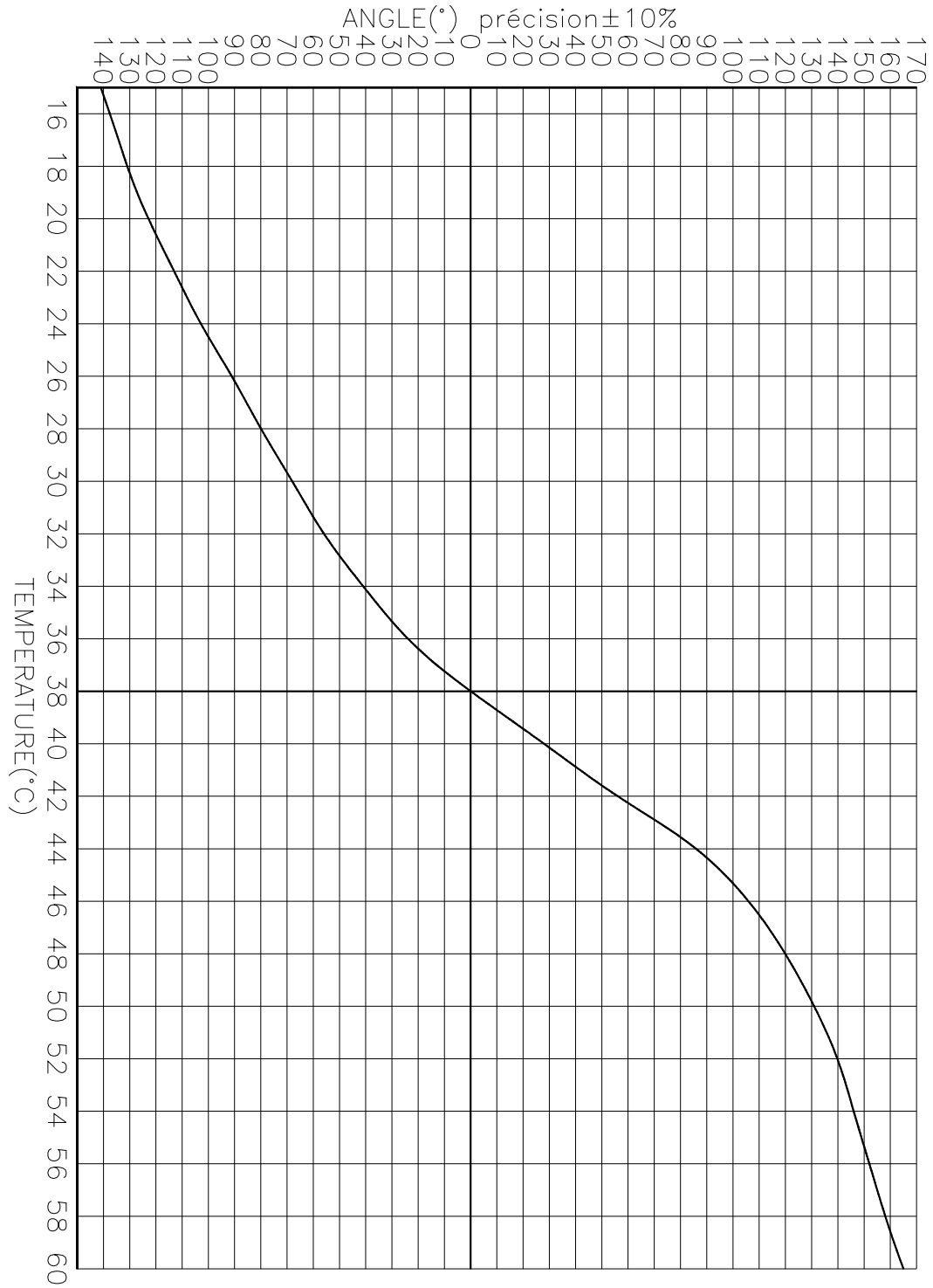


**DISPLAY ANGLES/TEMPERATURE : CA43L, CA43G**

**(applies only to standard cartridges with temperature range 15-60°C)**

**Inlet water temperatures: 15°C and 65°C**

**P : 3 bar**



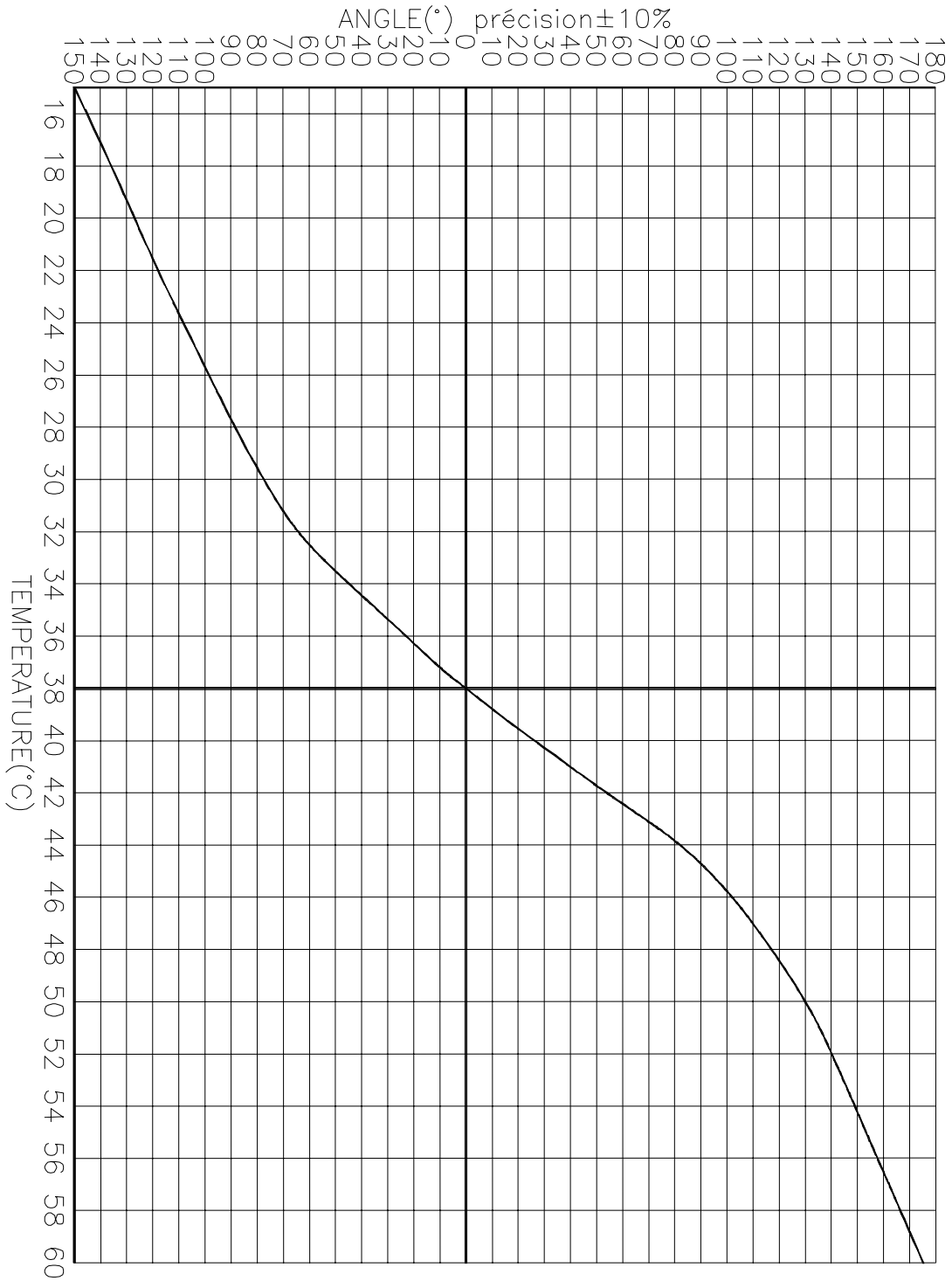


**DISPLAY ANGLES/TEMPERATURE : CA43XB or CA43PB**

**(applies only to standard cartridges with temperature range 15-60°C)**

**Inlet water temperatures: 15°C and 65°C**

**P : 3 bar**



### **3-DIMENSIONS & RECOMMENDATIONS FOR INTERFACES**

#### **3.1. CA43 Cartridge geometry**

The different CA43 cartridges have the same geometry.

Please note the overall geometry and the denticulation on pages 11 and 12.

#### **3.2. Installation in the mixing valve body** (See page 13).

This geometry permits to fit and to fix the CA43 cartridges in the mixing valve.

It is imperative to :

- respect the limits of roughness, the input chamfers and the cleanliness (degreased body, without burrs) to ensure the water tightness.
- Respect the depth of the input water grooves to obtain correct flow around the cartridge, this is very important to obtain good temperature regulation and also to avoid noise production or hydraulic vibrations.

The pressure drop across the mixing valve (without the cartridge) should be kept to a minimum .

#### **3.3. Operating devices**

Vernet supplies the cartridge without control knob, index-ring and stop-ring as we consider this to be an integrated part of the styling of the mixing-valve. However you will find a principle diagram on page 14.

**Very important : A stop-ring has to be used. Under no circumstances should the extreme positions of the cartridge be used as hot or cold water stop, the cartridge could be destroyed.**

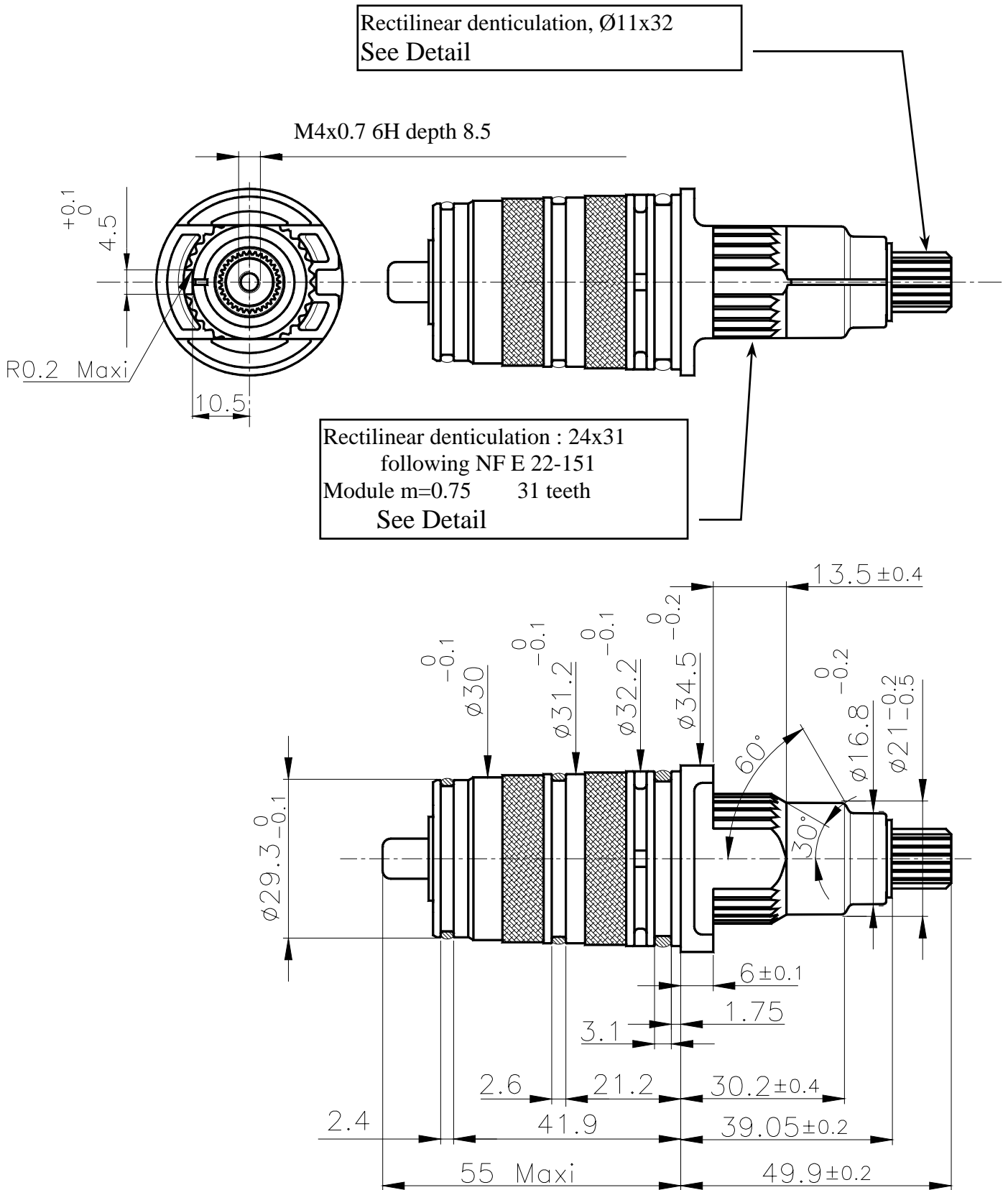
We recommend an angle of 135° between the position of 38°C (100°F) and the stop on the cold side and an angle of 150° between the position 38°C (100°F) and the stop on the hot side.

If the chosen reference-point is not 38°C (100°F), you may correct it as a function of the drawing angle/temperature (pages 7 to 9).

To fix the stop-ring on the cartridge, we recommend the use of an internal denticulation according to the drawing page 15.

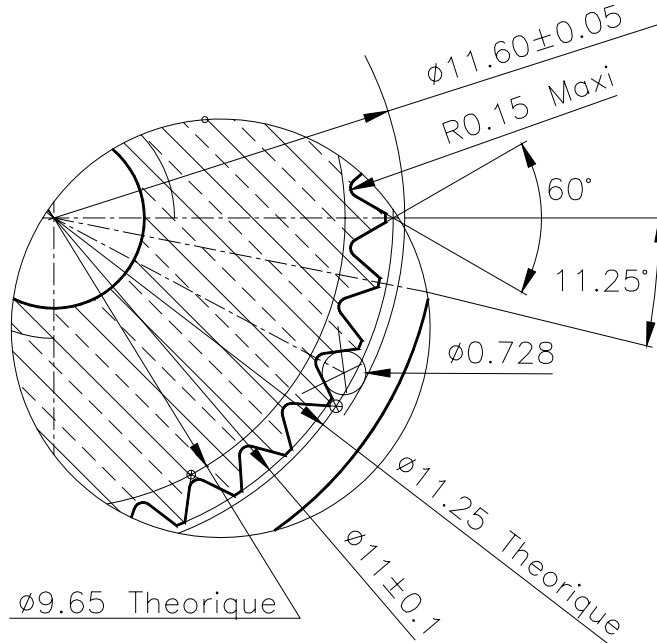
To fix the Index ring on the screw of the cartridge, we recommend the use of an internal denticulation according to the drawing page 16.

**CARTRIDGE OVERALL GEOMETRY**

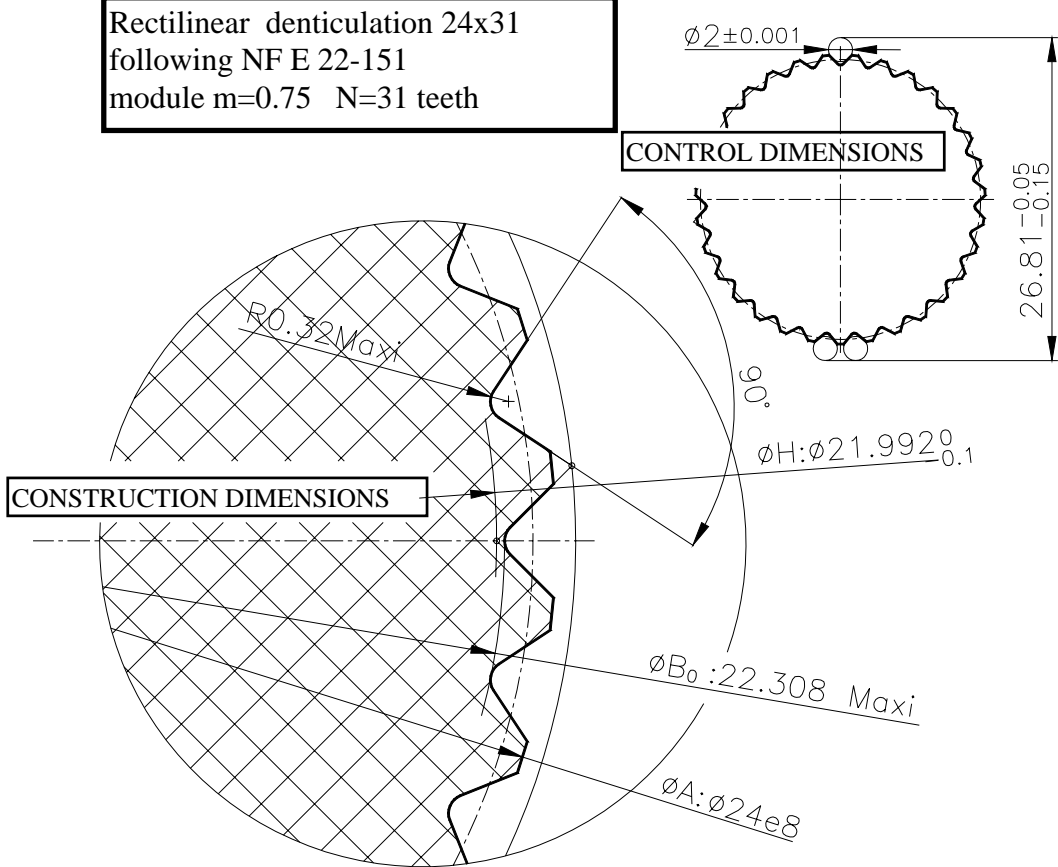


**DENTICULATIONS**

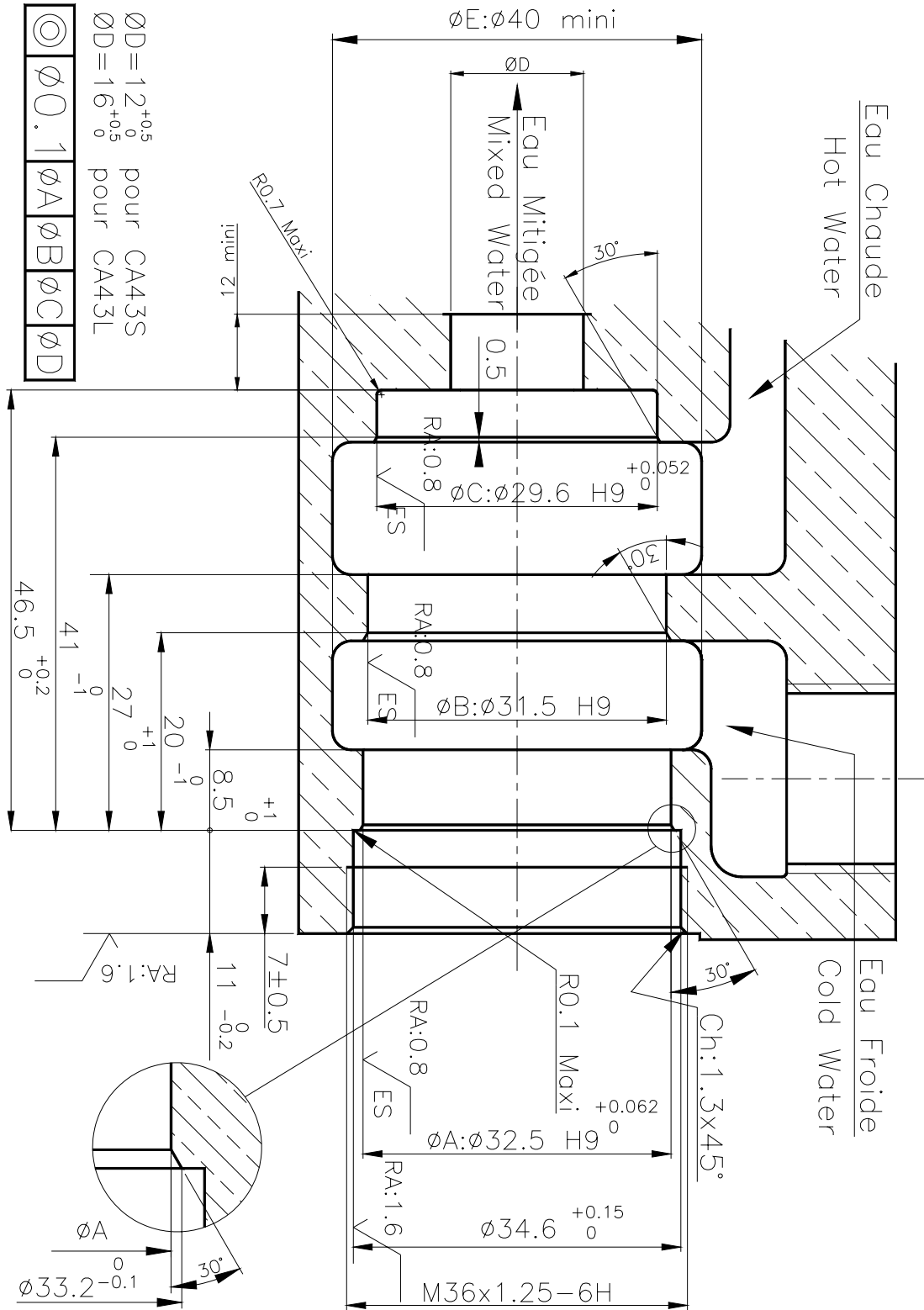
**Rectilinear denticulation Ø11x32**



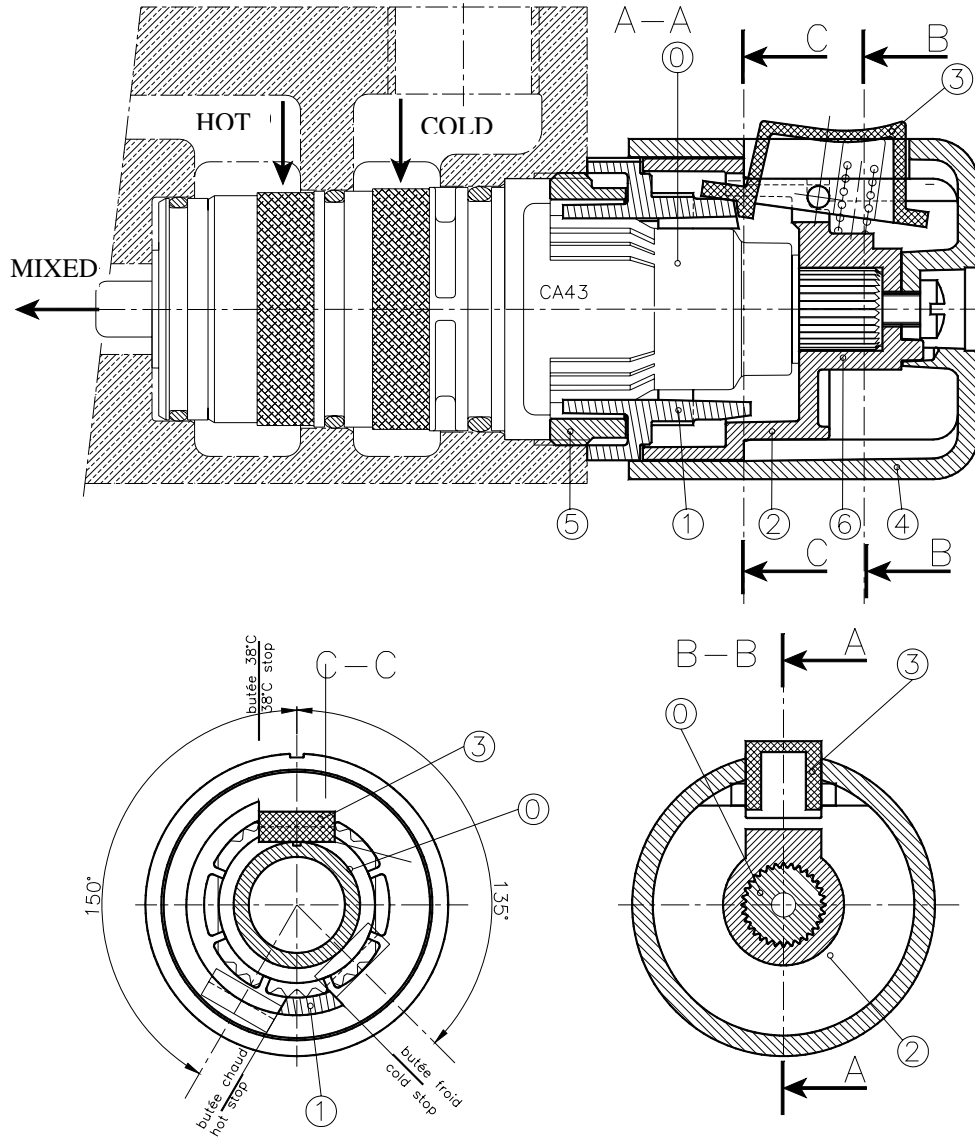
**Rectilinear denticulation 24x31  
following NF E 22-151  
module  $m=0.75$   $N=31$  teeth**



**RECOMMENDED INSTALLATION FOR CA43 CARTRIDGE**



**EXAMPLE OF REGULATION KNOB FOR CA43**

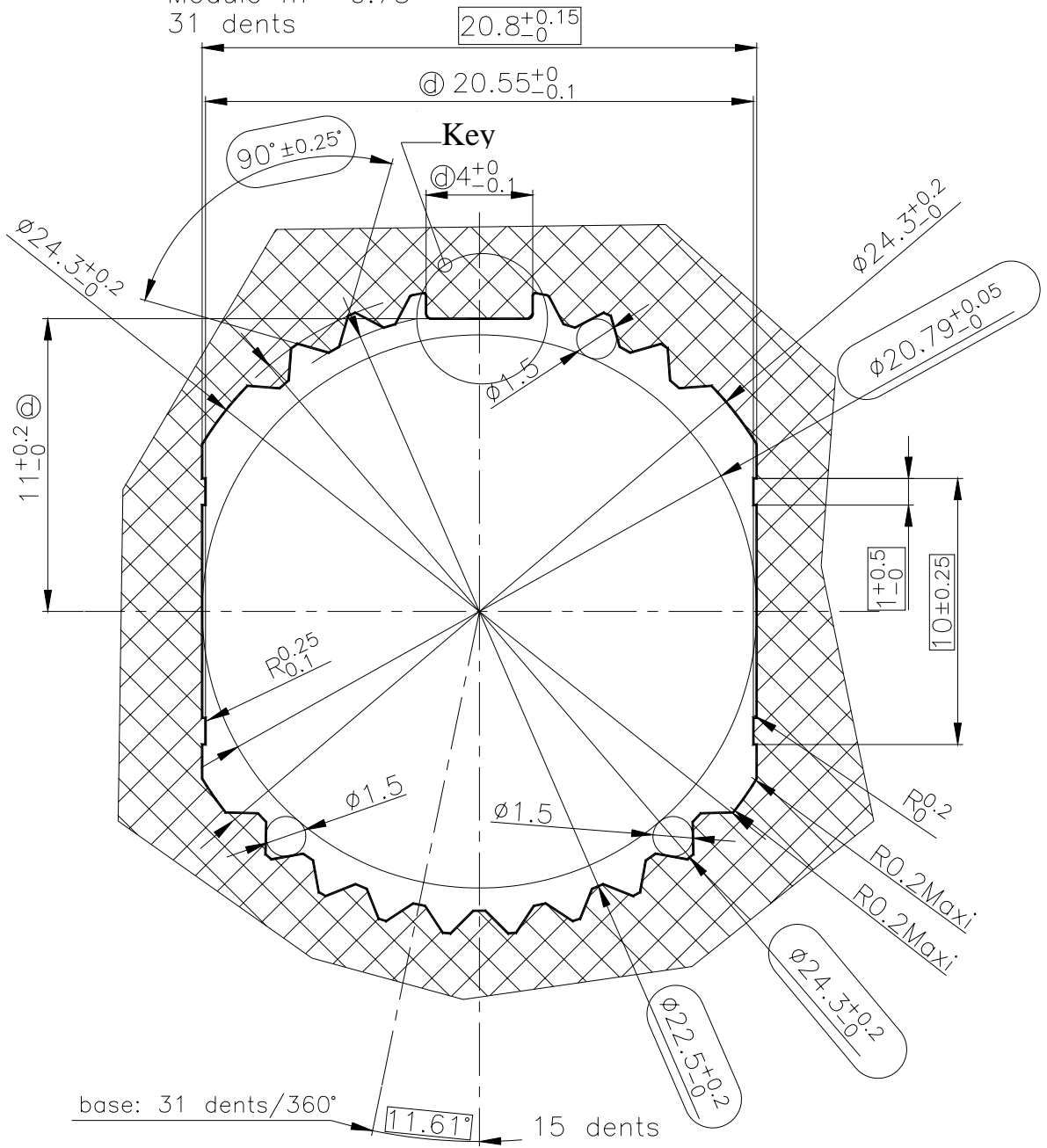


- 0:** Cartridge CA43
- 1:** Stop ring
- 2:** Index ring
- 3:** Anti-scald knob
- 4:** Regulation knob
- 5:** Locking nut

**INTERNAL SHAPE OF THE STOP RING**

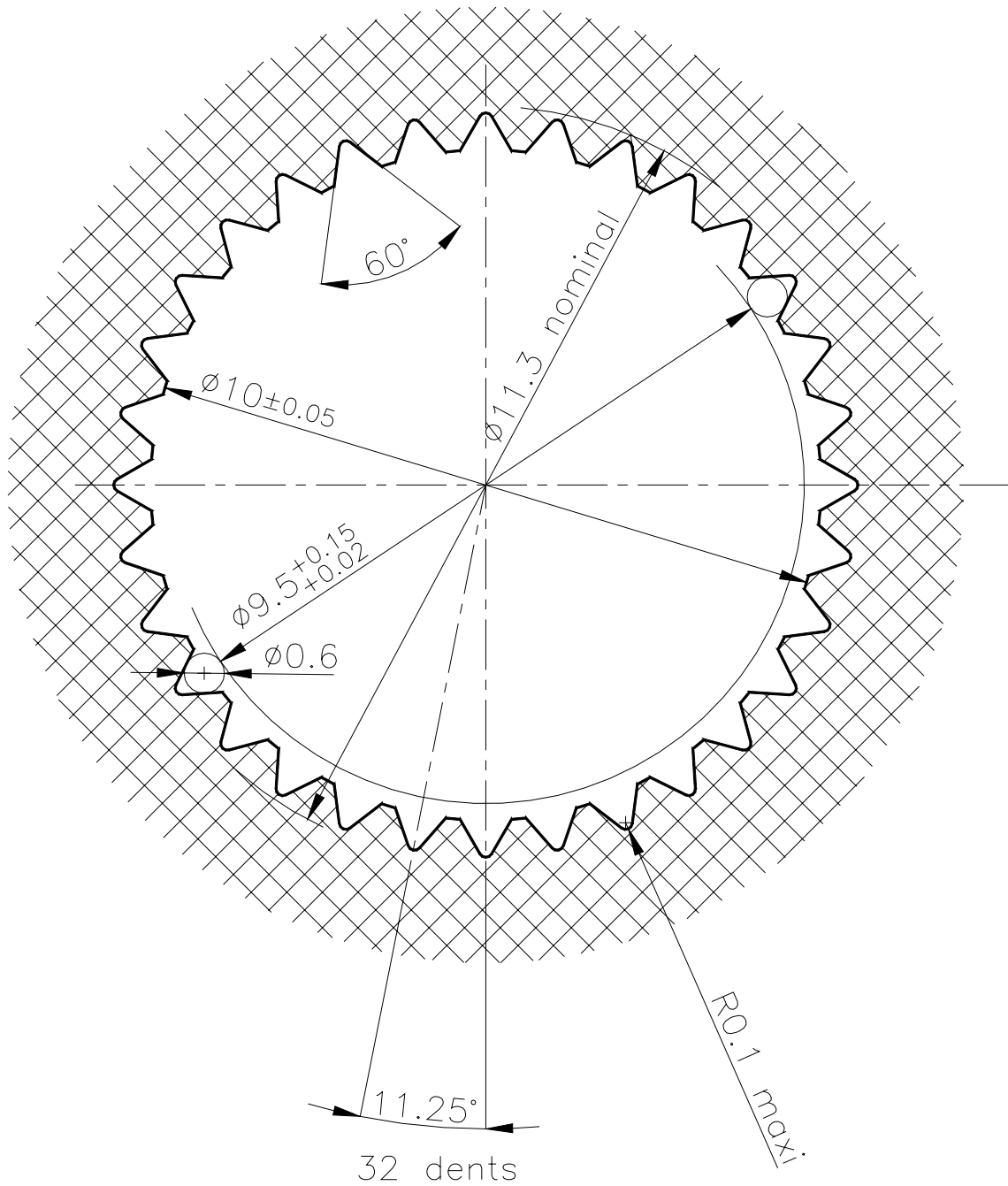
**RECTILINEAR DENTICULATION, 24x31  
according to NF E22-151**

Module  $m = 0.75$   
31 dents



**Respect angular position/key**

ECHELLE 5

**INTERNAL SHAPE OF THE INDEX RING****RECTILINEAR DENTICULATION Ø11x32**



## **4 – QUALITY CONTROL OPERATIONS CARRIED OUT BY VERNET ON THE CA43**

VERNET has test benches recording pressure and temperature in accordance with tests included in NF 18-203, EN1111, NHS DO8 and ASSE 1016 standards.

CA43 cartridges are submitted to a 100% anti-scald function test (hot water isolation in case of cold water failure) in accordance with NF 18-203 as well as a thermal control check.

Cartridges have an indelible (permanent) marking :

This marking provides tracability of components and calibration.

## **5 - FITTING RECOMMENDATIONS**

### **5.1. Risk of non-function if impurities are present**

Even though our cartridges are equipped with filters, fine impurities such as sand and metallic burrs, may disturb their function, especially the anti-scald safety function in case of cold water failure. To minimize this risk, we recommend the following actions :

- The installation of filters on the mixing valve inlets.
- A careful rinsing of the mixing valves assists the removal of grit, burrs or other impurities which may be lodged, before the fitting of the CA43 cartridge.
- Installers are recommended to drain the pipes in order to remove all the impurities before installing the mixing valve.

### **5.2. Assembly**

We recommend the following operations :

- 1) Place the CA43 cartridge in the rinsed mixing valve body,
- 2) Lock the cartridge in the mixing valve with the nut (screwing torque of 15 N.m maximum) with a 32 mm wrench (the nut can be supplied by Vernet, see drawing page 19).
- 3) Fit the adjustment ring on the cartridge denticulations.

- 4) Proceed to the 38°C setting by turning the spindle under the following conditions:
  - Hot water temperature between 60°C to 65°C,
  - Cold water temperature between 10°C to 15°C,
  - Temperature difference = 50 K,
  - Pressure = 3 bar,Set the button to 38°C position starting from full-cold opening temperature position.
- 5) Fit the setting button on the brass spindle. The adjustment stop button must correspond to the 38°C stop of the stop ring, without moving the spindle! The setting is correct when a temperature of mixed water of  $38 \pm 1^\circ\text{C}$  is achieved, with the stop button at the 38°C position.
- 6) Complete the assembly of the adjustment button (fixing screw, cover, ...).
- 7) Check water tightness.

### 5.3 Use of grease

The cartridges are delivered with the gaskets greased. If any grease is to be added before fitting in the valve, **only silicone grease is to be used. If any other grease is used, the EPDM-gaskets might deteriorate (swelling, hardening).**

## 6 – INSTALLATION RECOMMENDATION OF THE MIXING VALVE

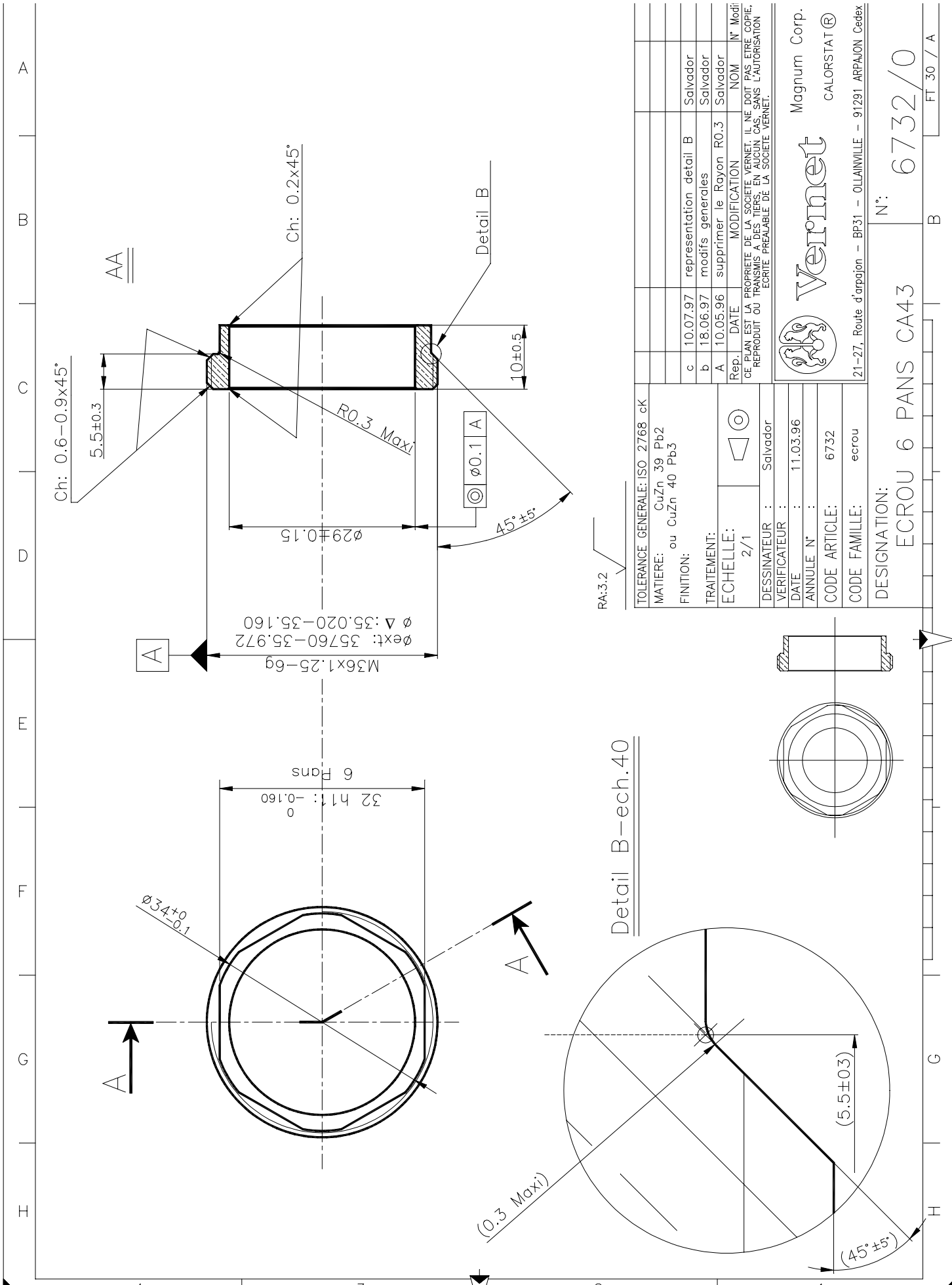
### 6.1 Pipes draining

We remind that it is imperative to drain the pipes before the installation of the mixing valve to avoid any damage to the CA43 cartridge.


### 6.2. Pressure control

To obtain an optimum function (regulation in conformance with the standards described in the previous paragraphs, absence of noise or hydraulic vibrations), we recommend a limiting of the hot/cold inlet pressures to 5 bar, with a difference of pressure between hot and cold not exceeding 2 bar.

**LOCKING NUT**



Detail B-ech.40

TOLERANCE GENERALE: ISO 2768 cK			
MATIERE: CuZn 39 Pb2 ou CuZn 40 Pb3			
FINITION:		c	10.07.97 representation detail B Salvador
		b	18.06.97 modifs generales Salvador
		A	10.05.96 supprimer le Rayon R0.3 Salvador
TRAITEMENT:		Rep.	DATE
ECHELLE: 2/1		MODIFICATION NOM N° Modif	
<p>CE PLAN EST LA PROPRIETE DE LA SOCIETE VERNET. IL NE DOIT PAS ETRE COPIE, REPRODUIT OU TRANSMIS A DES TIERS, EN AUCUN CAS, SANS L'AUTORISATION ECRITE PREALABLE DE LA SOCIETE VERNET.</p>			
DESSINATEUR : Salvador		 <p><b>Vernet</b> Magnum Corp. CALORSTAT®</p>	
VERIFICATEUR :		21-27, Route d'arpojon - BP31 - OLLAINVILLE - 91291 ARPAJON Cedex	
DATE : 11.03.96			
ANNULE N° :			
CODE ARTICLE: 6732			
CODE FAMILLE: ecrou			

DESIGNATION: ECROU 6 PANS CA43 N°: 6732/0

FT 30 / A



## ATTESTATION DE CONFORMITE SANITAIRE

Conformément à l'arrêté du 29 Mai 1997 modifié et la circulaire du Ministère de la Santé – Direction Générale de la Santé DGS/SD7A 2002 N°571 du 25 Novembre 2002

Coordonnées du demandeur d'ACS :

**VERNET**  
**21-27, route d'Arpajon Ollainville**  
**BP 31**  
**91291 Arpajon Cedex**

Nom de l'accessoire représentatif :

**Cartouche thermostatique plastique CA43XB**

N° de dossier attribué par le laboratoire : **04ACC.PA037**

Date de réalisation des essais d'inertie, le cas échéant :

**26 Avril 2004**

Commentaires : -

Famille d'accessoires couverts par l'ACS :

**CA43; CA43G ; CA43J ; CA43L ; CA43M ; CA43N ; CA43PB ; C43PJ ; CA43R ; CA43SH ; CA43XB ; CA43XE ; CA96V1 ; CA96V2.**

Commentaires : -

Attestation délivrée par le Crecep à la date du :

**29 juin 2004**

Signature :

Date d'expiration de l'ACS :

**29 juin 2009**

**Jean BARON**  
Responsable du Département  
Matériaux & Corrosion

**Centre de recherche d'expertise et de contrôle des eaux de Paris**

144 et 156, av. Paul Vaillant-Couturier • 75014 Paris • Tél. : 01 40 84 78 78 • Fax : 01 40 84 77 66 • www.crecep.fr  
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