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**AUTO TORQUE INDICATOR**  
(BS EN 14399 Part-9)



**AUTO TORQUE CHECK BOLT ASSEMBLY**  
(BS EN 14399 Part-10)



**ARC WELDING STUD**



**TS BOLT ASSEMBLY (TAMPER PROOF)**



**HIGH STRENGTH STRUCTURAL BOLT**



## **Unbrako Construction Fasteners**

**(CE Approved)**

## Unbrako

Unbrako is a single source, full service provider of engineered, high strength precision fasteners for industrial, infrastructure, petrochemical, automotive and other custom designed applications where Quality, Performance and Reliability make the difference. Unbrako products are primarily used in performance critical applications and incorporate unique design and workmanship features that enable them to withstand high fatigue loads and cycles over prolonged periods. Unbrako's manufacturing and engineering facilities operate around the clock to cater for the needs of its customers.

## Global Strength

Since 1911, Unbrako has been a leader in advancing the technology of bolted joints and meeting the needs of industry for stronger and better performing fasteners. Products such as the famous Unbrako® socket head cap screw and Durlok® fasteners are the solutions of choice for engineering applications across the world. Today, Deepak Fasteners (DFL) along with its Unbrako division operates in over 35 countries across 4 continents and supplies the automotive, aerospace, engineering and construction industries with advanced products and sophisticated fastening solutions.

## Commitment To Excellence

Unbrako is committed to total customer satisfaction. This is achieved through continuous improvement in every operational aspect, via Unbrako Quality Assurance system that aims at Zero defect manufacture and supply. Unbrako's True goal is to provide the best solution at optimal cost, every time and on time.



# Our Commitment To Quality



ISO 9001 : 2008



ISO / TS 16949:2009



CE CERTIFICATION- 14399 & 15048



DELTA DORKEN APPROVAL



## Unbrako Auto Torque Indicator (ATI)



### Product Range

M16 - M36

AVAILABLE IN GRADE 8.8 AND 10.9

Unbrako feeler gauge - used for checking if the required torque is achieved

### Introduction

UNBRAKO AUTO TORQUE INDICATORS, or ATIs, are simple bolt-tension (or load) indicating devices. These are single use mechanical load cells used to indicate if the required tension has been achieved in structural fastener assemblies. UNBRAKO ATI's are manufactured as per BS EN 14399-9 (CE Certified).

Unbrako Auto Torque Indicators are hardened washer shaped devices incorporating small arch-like protrusions on the bearing surface that are designed to indicate the magnitude of the preload in the assembly.

Unbrako Auto Torque Indicator is installed under either a bolt head or under a nut, along with a hardened washer. As a fastener assembly is tightened, the arch-like protrusions deform in a controlled manner, when subjected to compressive load. The change in distance between the base of the protrusions of the ATI and the protrusion apex correlates to a value of tensile force induced into the fastener. This distance can then be verified by insertion of a tapered feeler gage between the protrusions to the bolt shank, and compared, either to the results of a pre-installation verification procedure or to the manufacturer's instructions.

An UNBRAKO ATI doesn't make it more complex to tension a bolt; it merely shows that the bolt has been properly tensioned. It is essentially useful in tensioning High Strength Structural Bolts Assemblies.

## Performance Test of Auto Torque Indicators

The auto torque indicators are tested on a calibrated load-measuring device. The load requirements are given in below Table 1 and shall be met when the auto torque indicators are compressed to the average gaps given in Table 2.

**TABLE 1**

For use with bolts of designation	Compression load			
	Designation H8		Designation H10	
	min.	max.	min.	max.
<b>M12</b>	47	56	59	71
<b>M16</b>	88	106	110	132
<b>M20</b>	137	164	172	206
<b>M22</b>	170	204	212	254
<b>M24</b>	198	238	247	296
<b>M27</b>	257	308	321	385
<b>M30</b>	314	377	393	472
<b>M36</b>	458	550	572	688

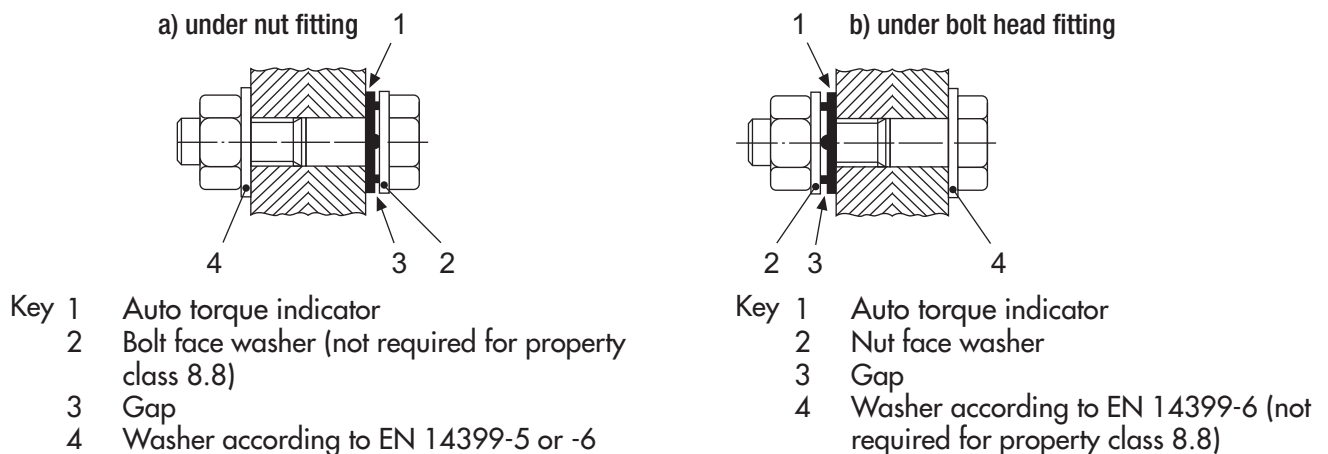
## Assemblies

Bolt and nut assemblies shall meet all the requirements of EN 14399-3, EN 14399-4, EN 14399-7 or EN 14399-8, which are also manufactured by UNBRAKO.

The functional characteristics of the bolt/nut/washer(s) assembly shall be achieved when tested together with auto torque indicators. The assembly configurations which can be used with auto torque indicators shall be according to Figures 1 and 2.

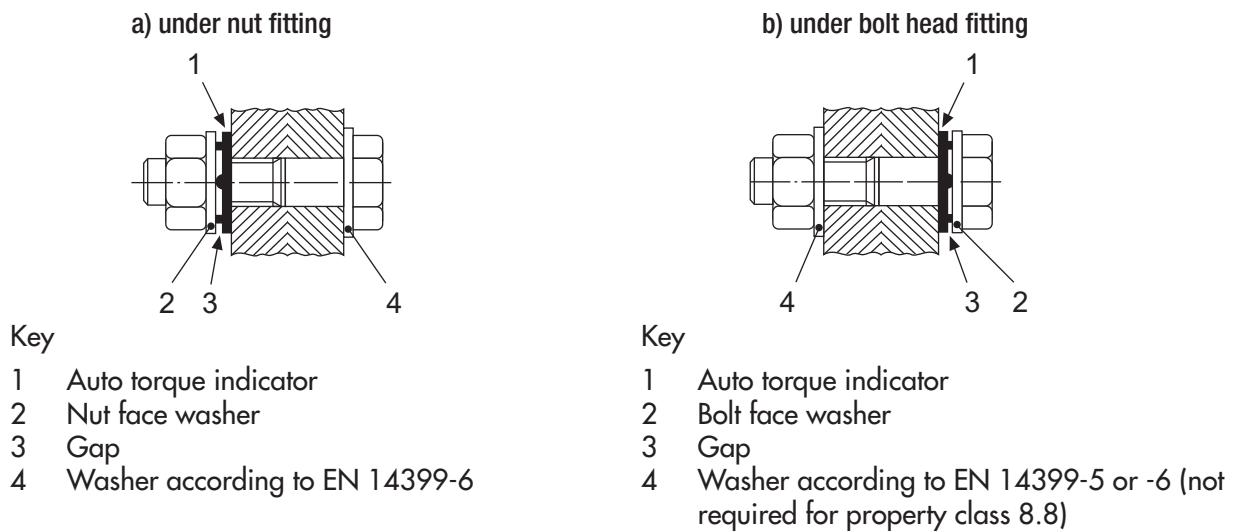
NOTE: With EN 14399-7 the auto torque indicator can only be fitted under the nut of the assembly.

**FIGURE 1 : TIGHTENING OF THE ASSEMBLY BY ROTATION OF THE NUT**



## Unbrako Auto Torque Indicator

FIGURE 2: Tightening Of The Assembly By Rotation Of The Bolt Head



### How To Check The Preload: Using Feeler Gauge

A specified feeler gauge, see Table 2, shall be used to determine that the required bolt preload has been achieved by the assembly.

The feeler gauge shall be used as a "no go" inspection tool. The average specified indicator gap shall be determined using the following measurement procedure; the feeler gauge should be pointed towards the centre of the ATI, and be placed in-between the protrusions (see Figure 3) and should refuse to enter the number of refusal spaces as specified in Table 3.

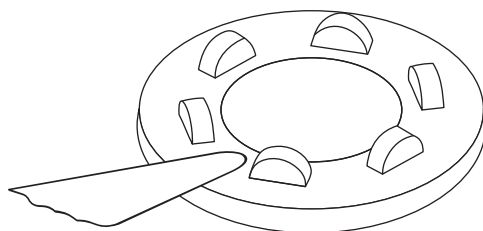
**NOTE:**

Tests have shown the need for a smaller gap when the auto torque indicator is used under the rotated component. Auto torque indicators fitted as specified will result in the same loads being attained when the bolts are tightened to the specified gaps.

TABLE: 2

Thickness Of The Feeler Gauge	
Auto torque indicator positions	Designation H8 and H10 Thickness of feeler gauge
Under bolt head, when nut is rotated (Figure 1a)	0,40
Under nut, when bolt is rotated (Figure 2a)	
Under nut, when nut is rotated (Figure 1b)	0,25
Under bolt head, when bolt is rotated (Figure 2b)	

<b>Feeler Gauge Requirements</b>	
Number of indicator protrusions	Minimum number of feeler gauge refusals
4	3
5	3
6	4
7	4
8	5
9	5



Checking the indicator gap (example with six protrusions)

## Disclaimer

All information contained in this catalogue has been prepared to assist users in their requirements for Studbolts. The information is based on International Fastener Standards. All such source material and information beyond the control of Deepak fastener Ltd (DFL) is subject to change.

Whilst every care has been taken to ensure that all information and technical data is accurate, DFL will not be liable to any customer that relies on any matter, fact or representation nor will it be liable for any subsequent damage or loss resulting from the use of any information contained in this catalogue. Customers are advised to make their own enquiries or seek independent advice regarding the fitness and suitability of the products listed.

The products listed in this catalogue might not be stocked at DFL at all times and customers are advised to enquire the availability of the same. E. & O.E.

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