

# Experts & Tools

WITH YOU





“You provide a complete solution of tools and services for your bearings, suited to your application, size and resources”

**Experts  
& Tools**

## NTN-SNR Expert & Tools, at the service of our customers

Because expectations for the maintenance and mounting of bearings are specific to each customer, Experts & Tools offers you solutions that take into account your application and its importance to you as an available resource.

Each application requires special expertise. Maintaining a wind turbine is different to maintaining a printing press or a meat mincer. With the theoretical and practical experience we have accumulated over almost a century of dealing with industrial applications, NTN-SNR can provide you with the expertise and tools you need.

The scale and difficulty of your mounting and maintenance tasks determine our recommendations. We provide a customised response in terms of tools and organisation, suited to your situation.

► **The NTN-SNR Group**, with more than 21,000 employees worldwide, produces and improves maintenance tools and methods on a daily basis.

Our aim is to bring you products and procedures that are safe and easy for your staff to use. The design of our tools is aimed at increasing your efficiency.

By reducing the amount of time it takes for mounting, dismantling as well as maintenance operations, and by maximising the working life of your bearings, our tools provide you with real savings and safety in use and will not damage the machinery they are being used on.

This catalogue contains the entire range of NTN-SNR maintenance tools. Our range of greases, greasers and centralised lubrication systems is contained in a separate catalogue.

### ► And if you decide to sub-contract your maintenance operations?

The Experts & Tools **teams** can take care of this, based on agreed availability targets for your machinery.

**Experts & Tools** offers you a range of services that can be customised to meet your specific requirements:

- **Theoretical** and practical training for your employees.
- **Expertise** on your damaged bearings (on site or in our laboratories).
- **Supervision** of the dismantling or mounting of your critical bearings. Of particular interest for larger bearings where we can supply appropriate tools, including handling tools.
- **Rental** of maintenance tools: bearing heaters, hydraulic nuts and pumps, etc.
- **Diagnosis** of your lubrication installations or an analysis of your needs, with the production and installation of appropriate standard or customised equipment.
- **Renovation** of bearings removed from equipment as part of a preventive maintenance programme.



## MAIN CAUSES OF FAILURES OF YOUR BEARINGS

► *The monitoring of the millions of NTN-SNR bearings sold has allowed us to establish very precise statistics on the origin of faults. This collection of data highlights one essential fact: it is rare that the bearing itself is the cause of a premature failure.*

*In 90% of cases, the causes can be found in external components which can be classified into four categories:*

### INAPPROPRIATE LUBRICATION (55%)

Inappropriate or incorrect lubrication significantly reduces the service life of the bearing.

It is often neglected because of bearing accessibility problems and a lack of knowledge about lubricants on the part of the user.

The choice of lubricant, the method, the quantity to apply to the bearing (neither too much nor too little) and the monitoring frequency must be properly studied.

NTN-SNR offers you a special service and markets a complete range of greases covering all applications, as well as an automatic greasing system.

### POLLUTION (18%)

The environment in which bearings operate is often highly polluted. Dust, liquid detergents, and other contaminants can severely reduce the working life of a bearing.

To deal with these problems, NTN-SNR has developed a comprehensive range of sealing systems and will be pleased to advise you on the best choice for your application.

### INCORRECT MOUNTING (17%)

The mounting of a bearing on a machine is a key stage in determining the length of its life. A bearing that is not mounted correctly can deteriorate very quickly.

The main causes are:

- *Insufficient or poorly adapted methods and resources,*
- *Contamination during mounting,*
- *The use of force during mounting,*
- *Poor preparation of the receiving components: shafts and housings outside tolerance, poor access for the lubricant, misalignment.*

Abnormal noise levels can be a warning sign of deterioration. In the short term this causes fatigue of the bearing surfaces. NTN-SNR can provide you with mounting and dismounting services or tools and equipment to make these operations easier and more secure.

### FATIGUE (10%)

Bearings are key components and are subject to fatigue. Even more so since they rarely operate in ideal conditions (overloaded machine, insufficient lubrication, etc.)

The stresses that active surfaces of bearings are subjected to create surface pitting damage sooner or later.

Our monitoring methods and support from our experts will enable you to act on the first indication of failure and organise appropriate maintenance operations.





# CONTENTS

## GENERAL

### P. 7 1 - MOUNTING & REMOVAL

- Cold mounting ..... 8
- Hot mounting ..... 12
- Mechanical dismounting ..... 17
- Hydraulic mounting  
and dismounting..... 26



### P. 31 2 - SAFETY & MEASUREMENT

- Safety instrument ..... 32
- Measurement instruments ..... 32



### P. 35 3 - TECHNICAL DATA



### P. 54 4 - GLOSSARY

|                          |                                                                    |
|--------------------------|--------------------------------------------------------------------|
| NER                      |                                                                    |
| T 33 / INDUSTRY<br>L SET | Mounting tool kit with 33 elements                                 |
| TEMP 301 / IR            | Infrared thermometer with laser<br>sighting targeting ratio 30 : 1 |





# CONTENTS

## MOUNTING & DISMOUNTING

### COLD MOUNTING

P. 8

|                                  |       |
|----------------------------------|-------|
| Mounting tool kit case . . . . . | P. 9  |
| Anti-fretting paste . . . . .    | P. 11 |
| Adjustable spanners . . . . .    | P. 11 |

### HOT MOUNTING

P. 12

|                             |       |
|-----------------------------|-------|
| Heating equipment . . . . . | P. 14 |
|-----------------------------|-------|

### MECHANICAL DISMOUNTING

P. 17

|                                                         |       |
|---------------------------------------------------------|-------|
| Bore puller kits . . . . .                              | P. 18 |
| Deep-groove ball bearings extractor kit . . . . .       | P. 19 |
| Self-centering mechanical puller . . . . .              | P. 20 |
| Self-centering hydraulic puller . . . . .               | P. 21 |
| Case of accessories for hydraulic puller . . . . .      | P. 22 |
| Tri-section pulling plate . . . . .                     | P. 23 |
| Puller - separator kit . . . . .                        | P. 24 |
| Hydraulic puller for mounting and dismounting . . . . . | P. 25 |

### HYDRAULIC MOUNTING AND DISMOUNTING

P. 26

|                                      |       |
|--------------------------------------|-------|
| Hydraulic nuts . . . . .             | P. 28 |
| Manual hydraulic pump kits . . . . . | P. 29 |
| Extended tubes . . . . .             | P. 30 |

## GOOD PRACTICES FOR COLD MOUNTING

Cold mounting is the simplest method and is suitable for small and medium-sized bearings, completed with the normal adjustments.

### OUR RECOMMENDATIONS:

The most frequently observed problems:

- Over- or under-tightening when adjusting.
- Excessive impacts during mounting or forces causing rings and seals to break, or races to become indented.
- The accidental introduction of particles or liquids present in the mounting environment.

► The bearing must be tightened on the rotating element to which it is fitted. See table below.

|                                           | Analysis of rotation (% Incidence)                                                                                                           |                                                                                                                                                  | Retention method              |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Fixed load with respect to the outer ring | Fixed housing and load (95%)<br><br>Rotating inner ring   | Rotating housing and load (0.5%)<br><br>Stationary inner ring | Inner ring tightened on shaft |
|                                           |                                                                                                                                              |                                                                                                                                                  |                               |
| Fixed load with respect to the inner ring | Stationary shaft and load (3%)<br><br>Rotating outer ring | Rotating shaft and load (1.5%)<br><br>Fixed outer ring        | Outer ring tight in housing   |
|                                           |                                                                                                                                              |                                                                                                                                                  |                               |

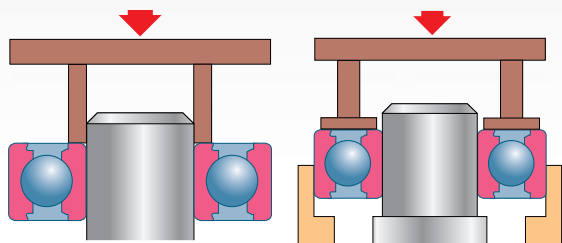
### OUR RECOMMENDATIONS TO BE FOLLOWED:

- Check bearing identifying marks against drawings, specifications and procedures.
- Check that bearing seat dimensions and the accuracy of their shape and position correspond to NTN-SNR drawings and specifications.
- Prepare all equipment, tools and parts required before commencing assembly.
- Carefully clean and check all parts and devices in the bearing's environment.
- Remove the bearing from its packaging at the last moment in a completely clean working area.

- Never wash it, except in specified exceptional cases. The bearing is protected from oxidation by a light film of oil compatible with all lubricants.
- Mount the bearing, using the chosen method.
- Lubricate, using a special bearing grease, following the instructions given.
- After mounting and before final start-up, check its operation, so as to detect any possible anomalies (noise, vibrations, temperature, abnormal play, etc.).

### IN PRACTICE:

► The sleeve is mounted by means of impact rings applied against the bearing ring which has the tightest fit. This avoids stressing the rotating body and damaging the bearing.



► In the case of a long shaft for mounting requiring longitudinal adjustment of the bearing, we prefer using a mechanical sleeve with tapered contact surface associated with a bearing with tapered bore.



### ► WHAT THE NTN-SNR EXPERTS HAVE TO SAY:

For easier mounting and to avoid contact corrosion of the shaft or the housing, always use an anti-fretting paste. This thick lubricant helps preserve the quality of parts surfaces subjected to sliding forces. Without this compound, corrosion would progressively cause the fit between bearing and shaft (or housing) to deteriorate, ultimately leading to vibrations and even the premature deterioration of the bearing and its mounting surfaces.

The anti-fretting paste also avoids introducing any pollutant during assembly (metal chips, liquid, etc.)



## COLD MOUNTING TOOL KIT CASE

The NTN-SNR tool kit enables the quick, accurate and safe mounting of bearings.

36



### APPLICATIONS

The use of a suitable socket, associated with the mounting sleeve, enables to install the bearing to the desired adjustment.

The simultaneous support of the outer and inner rings prevents the risk of deterioration of the races and rotating assemblies.

The kit can also be used for assembling other components such as sealing rings, pinions and pulleys.

### ADVANTAGES

Of light and strong construction for workshop use, this toolbox contains:

#### 33 impact rings:

- Very robust for a long working life.
- In impact-resistant, synthetic material, avoiding any metal-to-metal contact.
- Ideal for use in conjunction with a press.
- Calibrated for approximately 400 different bearings:
  - with bore diameters between 10 and 50 mm
  - and with outside diameters between 26 and 110 mm
- Clearly and permanently identified to aid selection.

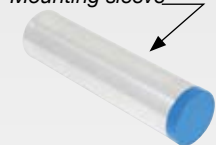
#### 3 mounting sleeves:

- Light and extremely robust, made of aluminium.
- With a good grip for the hand.

**1 special dead blow mallet, ensuring optimum impact force is applied.**



Mounting sleeve



Socket for the mounting sleeve



Impact ring



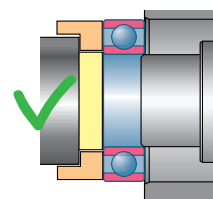
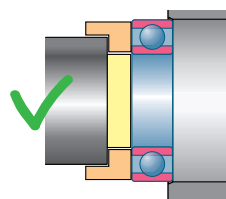
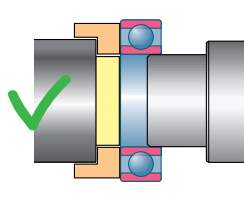
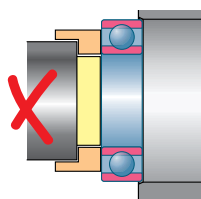
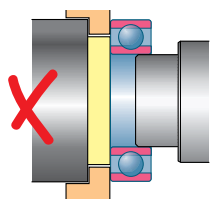
Dead-blow Mallet

### COMMERCIAL REFERENCE

TOOL IFT SET 33 / Industry Fitting Tool Set

### SPARE PARTS (to order)

- **Impact ring**  
TOOL IMPACT RING (tube A,B,C), socket  
Example: *TOOL IMPACT RING A 10-25*
- **Dead-blow mallet**  
TOOL IMPACT RING HAMMER
- **Mounting sleeve**  
TOOL IMPACT RING SLEEVE (tube A,B,C)  
Example: *TOOL IMPACT RING SLEEVE A*
- **Socket for mounting sleeve**  
TOOL IMPACT RING LOOSE RING (tube A,B,C)  
Example: *TOOL IMPACT RING LOOSE RING A*



39

This symbol, close to each product, informs you on which page you can find technical characteristics.

### COLD MOUNTING TOOL KIT CASE - TECHNICAL DATA

| Ref.<br>Tubes                                                                     | Ref.<br>Bushings                                                                  | Series<br>60 62<br>63 64<br>16 62/63/98                                           | Series<br>622<br>623<br>630                                                       | Series<br>12 22<br>13 23                                                          | Series<br>72<br>73                                                                | Series<br>32 52<br>33 53                                                          | Series<br>213<br>222<br>223                                                         | Series<br>10<br>2 3<br>22 23                                                        | Series<br>C22<br>C40                                                                | Series<br>42<br>43                                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |
| A                                                                                 | 10 / 26                                                                           | 629<br>16100<br>6000                                                              | 63000                                                                             | 129                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 10 / 30                                                                           | 6200                                                                              | 62200                                                                             | 1200<br>2200                                                                      | 7200                                                                              | 3200<br>5200                                                                      |                                                                                     |                                                                                     |                                                                                     | 4200                                                                                |
|                                                                                   | 10 / 35<br>12 / 28                                                                | 6300<br>6001<br>16101                                                             | 62300<br>63001                                                                    |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 12 / 32                                                                           | 6201                                                                              | 62201                                                                             | 1201<br>2201                                                                      | 7201                                                                              | 3201<br>5201                                                                      |                                                                                     |                                                                                     |                                                                                     | 4201                                                                                |
|                                                                                   | 12 / 37                                                                           | 6301                                                                              | 62301                                                                             | 1301<br>2301                                                                      | 7301                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     | 4301                                                                                |
|                                                                                   | 15 / 32                                                                           | 16002<br>6002                                                                     | 63002                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 15 / 35                                                                           | 6202                                                                              | 62202                                                                             | 1202<br>2203                                                                      | 7202                                                                              | 3202<br>5202                                                                      |                                                                                     | 202                                                                                 |                                                                                     | 4202                                                                                |
|                                                                                   | 15 / 42                                                                           | 6302                                                                              | 62302                                                                             | 1302<br>2302                                                                      | 7302                                                                              | 3302<br>5302                                                                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 17 / 35                                                                           | 16003<br>6003                                                                     | 63003                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 17 / 40                                                                           | 98203<br>6203                                                                     | 62203                                                                             | 1203<br>2203                                                                      | 7203                                                                              | 3203<br>5203                                                                      |                                                                                     | 203<br>2203                                                                         |                                                                                     | 4302<br>4203                                                                        |
|                                                                                   | 17 / 47                                                                           | 6303                                                                              | 62303                                                                             | 1303<br>2303                                                                      | 7303                                                                              | 3303<br>5303                                                                      |                                                                                     | 303                                                                                 |                                                                                     | 4303                                                                                |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
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| B                                                                                 | 20 / 42                                                                           | 16004<br>98204<br>6004                                                            | 63004                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 20 / 47                                                                           | 6204                                                                              | 62204                                                                             | 1204<br>2204                                                                      | 7204                                                                              | 3204<br>5204                                                                      |                                                                                     | 204<br>2204                                                                         |                                                                                     | 4204                                                                                |
|                                                                                   | 20 / 52                                                                           | 6304                                                                              | 62304                                                                             | 1304<br>2304                                                                      | 7304                                                                              | 3304<br>5306                                                                      | 22205/20                                                                            | 304<br>2304<br>1005                                                                 |                                                                                     | 4304                                                                                |
|                                                                                   | 25 / 47                                                                           | 16005<br>6005<br>62/22                                                            | 63005                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 25 / 52                                                                           | 98205<br>6205<br>63/22                                                            | 62205                                                                             | 1205<br>2205                                                                      | 7205                                                                              | 3205<br>5205                                                                      | 22205                                                                               | 205<br>2205                                                                         | C2205                                                                               | 4205                                                                                |
|                                                                                   | 25 / 62                                                                           | 6305<br>6403                                                                      | 62305                                                                             | 1305<br>2305                                                                      | 7305                                                                              | 3305<br>5305                                                                      | 21305                                                                               | 305<br>2305                                                                         |                                                                                     | 4305                                                                                |
|                                                                                   | 30 / 55                                                                           | 16006<br>6006<br>62/28                                                            | 63006                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     | 1006                                                                                | C6006                                                                               | 4206                                                                                |
|                                                                                   | 30 / 62                                                                           | 98206<br>6206<br>63/28                                                            | 62206                                                                             | 1206<br>2206                                                                      | 7206                                                                              | 3206<br>5206                                                                      | 22206<br>BS2-2206                                                                   | 206<br>2206                                                                         | C2206                                                                               |                                                                                     |
|                                                                                   | 30 / 72                                                                           | 6306<br>6404                                                                      | 62306                                                                             | 1306<br>2306                                                                      | 7306                                                                              | 3306<br>5306                                                                      | 21306<br>2306                                                                       | 306                                                                                 |                                                                                     | 4306                                                                                |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
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| C                                                                                 | 35 / 62                                                                           | 16007<br>6007                                                                     | 63007                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     | 1007                                                                                |                                                                                     |                                                                                     |
|                                                                                   | 35 / 72                                                                           | 6207                                                                              | 62207                                                                             | 1207<br>2207                                                                      | 7207                                                                              | 3207<br>5207                                                                      | 22207<br>BS2-2207                                                                   | 207<br>2207                                                                         | C2207                                                                               | 4207                                                                                |
|                                                                                   | 35 / 80                                                                           | 6307<br>6405                                                                      | 62307                                                                             | 1307<br>2307                                                                      | 7307                                                                              | 3307<br>5307                                                                      | 21307                                                                               | 307<br>2307<br>1008                                                                 |                                                                                     | 4307                                                                                |
|                                                                                   | 40 / 68                                                                           | 16008<br>6008                                                                     | 63008                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 40 / 80                                                                           | 6208                                                                              | 62208                                                                             | 1208<br>2208                                                                      | 7208                                                                              | 3208<br>5208                                                                      | 22208<br>BS2-2208                                                                   | 208<br>2208                                                                         | C2208                                                                               | 4208                                                                                |
|                                                                                   | 40 / 90                                                                           | 6308<br>6406                                                                      | 62308                                                                             | 1308<br>1308                                                                      | 7308                                                                              | 3308<br>5308                                                                      | 21308<br>22308                                                                      | 308<br>2308                                                                         |                                                                                     | 4308                                                                                |
|                                                                                   | 45 / 75                                                                           | 16009<br>6009                                                                     | 63009                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     | 1009                                                                                |                                                                                     |                                                                                     |
|                                                                                   | 45 / 85                                                                           | 6209                                                                              | 62209                                                                             | 1209<br>2209                                                                      | 7209                                                                              | 3209<br>5209                                                                      | 22209<br>BS2-2209                                                                   | 209<br>2209                                                                         | C2209                                                                               | 4209                                                                                |
|                                                                                   | 45 / 100                                                                          | 6309<br>6407                                                                      | 62309                                                                             | 1309<br>2309                                                                      | 7309                                                                              | 3309<br>5309                                                                      | 21309<br>22309                                                                      | 309<br>2309                                                                         |                                                                                     | 4309                                                                                |
|                                                                                   | 50 / 80                                                                           | 16010<br>6010                                                                     | 63010                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     | 1010                                                                                | C4010                                                                               |                                                                                     |
|                                                                                   | 50 / 90                                                                           | 6210                                                                              | 62210                                                                             | 1210<br>2210                                                                      | 7210                                                                              | 3210<br>5210                                                                      | 22210<br>BS2-2210                                                                   | 210<br>2210                                                                         | C2210                                                                               | 4210                                                                                |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   | 50 / 110                                                                          | 6310<br>6408                                                                      | 62310                                                                             | 1310<br>2310                                                                      | 7310                                                                              | 3310<br>5310                                                                      | 21310<br>22310                                                                      | 310<br>2310                                                                         |                                                                                     | 4310                                                                                |

## ANTI-FRETTING PASTE

The NTN-SNR anti-fretting paste is specially designed to prevent contact rust between 2 metal surfaces.

36



### APPLICATIONS

- Contact corrosion, also known as fretting corrosion, appears in assemblies subjected to vibration or very slight slippage or oscillation. It can lead to the serious deterioration of bearings and other machine components and thus make dismantling very difficult.

### ADVANTAGES

- Allows slippage for assemblies with play (wheel bearings, vibrating screens, etc.).
- Preserves the quality of the surfaces and the adjustment of mechanical assemblies by preventing contact (fretting) corrosion.
- Facilitates the mounting and dismantling of bearings and components such as nuts, bolts, pins, flanges, couplings, fluted shafts, etc.
- Water and washing resistant.
- Temperature range for use -40°C to +150°C.

### COMMERCIAL REFERENCES

LUB ANTI FRETTING PASTE / T 60G  
LUB ANTI FRETTING PASTE / B 750G

## ADJUSTABLE SPANNERS

10 spanners for tightening and loosening up to 30 differently sized nuts!

36



### APPLICATIONS

- NTN-SNR adjustable spanners enable the safe and effortless tightening and loosening of all KM, KML and KMK type nuts and also B, TB, BR and TBR precision nuts. They avoid any damage to the nuts or the shaft.

### ADVANTAGES

- Made of special tempered steel, these spanners are extremely strong.
- The joint with its spring washer guarantees gentle reliable operation.
- The laser-etched imprint makes them easily and permanently identifiable.
- The hole in the handle makes them easy to store.
- They are adaptable to cover nut diameters from 15 to 180 mm.

Available in two versions:

With pins for nuts with holes

With hook for slotted nuts



### COMMERCIAL REFERENCES

TOOL PS (size) / Pin Spanner (with pin)  
TOOL HS (size) / Hook Spanner (with hook)

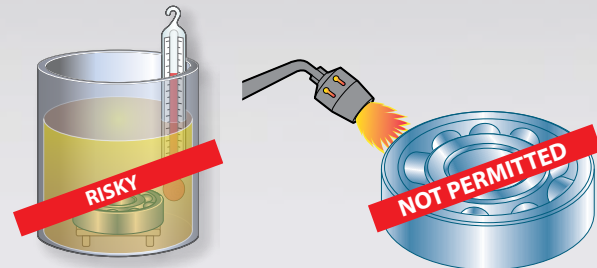
## GOOD PRACTICES FOR HOT MOUNTING

Hot mounting makes it possible, by raising the bearing's temperature, to expand the inner ring so that it can be fitted over the shaft with ease.

- In the event of tight fitting on the outer ring, prior to the insertion of the bearing, the housing may be made to expand through heating.
- Conversely, a shaft can also be cooled using liquefied gas in order to facilitate its insertion into the inner ring of the bearing.

NTN-SNR's induction heaters provide the best solution in terms of safety, cleanliness and speed compared with oil-bath heating, hot plates or ovens.

Heating using a blowtorch is to be prohibited: it generates localised temperatures that alter the hardness of the bearing and therefore shorten its service life.

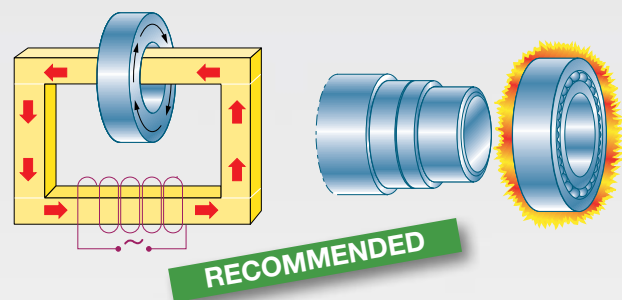


### PRINCIPLE OF HEATING BY INDUCTION

The device comprises of a laminated steel core surrounded by a coil with multiple windings. When a current passes through it, this primary coil generates a magnetic field which itself induces an electric current in the bearing (or other steel part), substituted for the secondary coil of an electrical transformer.

When a high-intensity, low-voltage AC current passes through it, the bearing heats up quickly; while non-metallic parts and the device itself remain cool.

Induction heating magnetises the bearing. It is therefore necessary for the heater to demagnetise it at the end of the heating cycle. This avoids steel particles being attracted into the bearing later on.



### WHAT THE NTN-SNR EXPERTS HAVE TO SAY:

The temperature should not be too high so as not to modify the characteristics of the steel (maximum 130°C) or of the internal components of the bearing.

On the other hand, the temperature must be high enough to generate sufficient expansion for the easy installation of the bearing through temporarily loosening the fit.

The heating temperature is a function of the ambient temperature, on the one hand and the fit of the seat on the other.

The mounting of a bearing onto a shaft or into a housing requires a certain skill for proper alignment. The use of anti-fretting paste facilitates insertion and protects the shaft or housing from contact corrosion.

The wearing of heat insulating gloves is essential for the safe and comfortable handling of the heated parts.

In the case of heavy bearings, help will be required for their handling (use of a textile sling and mobile hoist or even an overhead crane).

### THE RIGHT QUESTIONS TO ASK YOURSELF WHEN SELECTING A HEATING DEVICE

- How big are the parts to be heated? (*Max. external diameter, max. width, min. and max. bore*)
- What are the min. and max. weights of the parts?
- What temperature has to be achieved?
- What electrical current and voltage are available in the workshop?

## THE MAJOR ADVANTAGES OF THE FAST THERM AND SAFE THERM RANGE:

### PRACTICAL AND SIMPLE IN USE

- Robust design for use in an industrial environment.
- Ready for immediate use.
- Requires no maintenance.
- The ergonomic, pivoting yoke of the 35, 150 and 300 models facilitates the positioning of the parts to be heated.
- User-friendly; the touch-screen controls can be operated while wearing protective gloves:
  - Only three buttons are required to programme the portable version (two for setting the temperature (+40°C to +240°C), and one to start),
  - 2 additional buttons on the other versions also enable control of the "heating time" (0 to 99 min),
  - Display of the temperature and time and also error codes for quick troubleshooting.
- Audible signal at the end of the heating cycle.
- Choice of °C or °F temperature display.



FAST THERM 35

### HEATING CONTROL AND SAFETY

- Optimum control of the heating cycle by microprocessor and magnetic temperature probe.
- Quick even heating of parts and no risk of over-heating.
- The equipment uses a default temperature of 110°C.
- Maximum heating temperature: +240°C.
- Automatic demagnetising at the end of the cycle.
- Ability to control the heating time to achieve a steady temperature rise and avoid stressing the bearing (Safe Therm 700 and 1200).

► The bearing's initial quality is maintained.

- Stop/start the device via an infrared remote control (Safe Therm 700 and 1200).
- Only the part to be heated is subjected to an increase in temperature (easier handling, no risk of burning).
- Thermal insulation of the magnetic probe.
- Meets EEC legislative standards.

► Operator safety ensured.

### ROBUST AND EFFICIENT

- Robust industrial design, guaranteed for three years.
- Oil-, dust- and water-resistant control screen.
- Quick and economical with its TURBO-BOOST operating mode.
- In a horizontal position (placed on a polyamide base), the part heats twice as quickly.
- Efficient, it is no longer necessary to heat the same part several times to keep it at the desired temperature. As soon as the temperature drops 5°C, the machine automatically resumes the heating cycle. This resumption occurs over five consecutive cycles.

### ENVIRONMENT-FRIENDLY

- No fumes or oil vapour.
- Excellent energy yield (approx. 80%), thus guaranteeing:
  - Savings in time and energy,
  - A longer life for the appliance.

*Delivered as standard with a temperature probe, protective gloves and instruction manual.*



FAST THERM 150



FAST THERM PROBE  
(temperature probe)



## HEATING EQUIPMENT

## FAST THERM 20



Portable induction heater.  
Light and easy to use, can heat a bearing of up to 40KG.

38

## ADVANTAGES

- Small, light **heater**: weighs only 17 kg.
- **Easy to use**, ideal for working on site.
- Designed for all bearings and rotating parts with a bore diameter above 10 mm with a maximum diameter of **280 mm** and a maximum weight of **40 kg**.

*Delivered as standard with its 3 core bars, a pair of gloves and a probe in a sturdy carrying case.*

## COMMERCIAL REFERENCE

TOOL FAST THERM 20 / Induction heater



## FAST THERM 35



Induction heater with pivoting arm, best-seller of maintenance or production workshops, which can heat a bearing of up to 70KG.

38

## ADVANTAGES

- Used as fixed equipment.
- **Compact**, it weighs only 35 kg and can be easily moved using its two side handles.
- **Multiple uses**: apart from the temperature control mode, it also has, like all the larger models, a heating time control for large parts (shrink-on rings, pinions, pulleys, etc.).
- **Ergonomic**: the **standard pivoting arm** facilitates the loading of the parts to be heated.
- Designed for all bearings and rotating parts with a bore diameter above 20 mm with a maximum diameter of **410 mm** and a maximum weight of **70 kg**.

*Delivered as standard with the core bar for bore diameters of 70 mm or more.*

*Three other available yoke sizes are available as an option and may be ordered to suit the application.*

## COMMERCIAL REFERENCE

TOOL FAST THERM 35 / Induction heater

## FAST THERM 150



Compact and economical induction heater, providing high heating power for bearings up to 150 kg.

38

### ADVANTAGES

- **Ergonomic:** The **standard pivoting arm** facilitates the positioning of parts to be heated.
- Voltage/Current **400 V/32 A**.
- Designed for all bearings and rotating parts in a horizontal position with a bore diameter over 30 mm with a maximum outside diameter of **490 mm** and a maximum weight of **150kg**.

*Delivered as standard with the core bar for bore diameters of 100 mm or greater. Five other available yoke sizes are available as an option and may be ordered to suit your particular application.*

### COMMERCIAL REFERENCE

TOOL FAST THERM 150 / Induction heater

## FAST THERM 300



Mobile and powerful induction heater for bearings up to 300 kg.

38

### ADVANTAGES

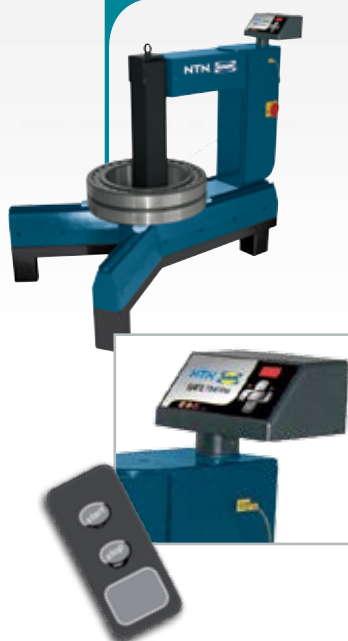
- **Ergonomic:** thanks to its **pivoting yoke** the parts to be heated can be positioned easily.
- Fitted on a **trolley with a yoke storage shelf**, it can be moved quickly and safely around the various areas of the production floor.
- Voltage/Current **400 V/32 A**.
- Designed for all bearings and rotating parts in a horizontal position with a bore diameter over 30 mm with a maximum outside diameter of **740 mm** and a maximum weight of **300 kg**.

*Delivered as standard with the core bar for bore diameters of 100 mm or greater. Five other available yoke sizes are available as an option and may be ordered to suit your particular application.*

### COMMERCIAL REFERENCE

TOOL FAST THERM 300 / Induction heater

## SAFE THERM 700



Sturdy and very powerful induction heater for very heavy parts up to 700 Kg for a bearing.

Machine typically intended for heavy machine workshops (steel-making, paper, gear manufacturing, naval yards, etc.).

39

### ADVANTAGES

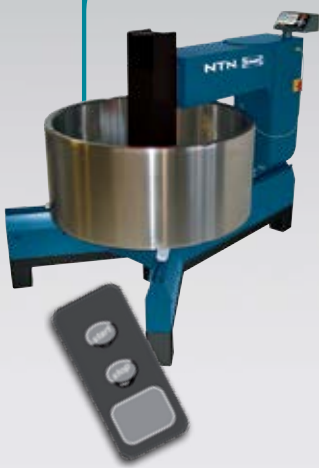
- **Ergonomic:**
  - The core bars are positioned vertically and are equipped with a lifting ring,
  - An optional core bar winch simplifies handling,
  - The control screen is directable for operator comfort.
- **Extremely robust:** The design in steel with a glass-fibre coating makes the Safe Therm 700 particularly resistant to impacts and corrosion.
- Parts may be heated **horizontally or vertically**. In the vertical position, the parts rest on support rails (they are not suspended on the fixed core bar).
- Voltage/Current **400 V/63 A**.
- Designed for all bearings and rotating parts in a horizontal position with a bore diameter over 45 mm with a maximum outside diameter of **900 mm** and a maximum weight of **700 kg**.
- Ability to control the heating time to achieve a steady temperature rise and avoid stressing the bearing.
- The device can be started and stopped remotely by means of a remote control, protecting the operator from excessive exposure to the magnetic field.

*Delivered as standard with the core bar for bore diameters of 145 mm or greater. Eight other available yoke sizes are available as an option and may be ordered to suit your particular application.*

### COMMERCIAL REFERENCE

TOOL SAFE THERM 700 / Induction heater

### SAFE THERM 1200



Extremely powerful induction heater for parts weighing up to 1200 kg.  
Indispensable in machine shops in steelworks, paper mills and the rail and wind turbine sectors.

39

#### ADVANTAGES

##### • Ergonomic:

- The core bars are positioned vertically and are equipped with a lifting handle,
- A core bar winch is offered as an option,
- The directable control screen provides added comfort for the operator.

##### • **Extremely robust:** made of steel with glass-fibre supports to be heated, particularly resistant to impacts and corrosion.

##### • Parts may be heated **horizontally or vertically**. In the vertical position, the parts rest on support rails (they are not suspended on the fixed horizontal core bar).

##### • Voltage/Current **400 V/100 A**.

##### • Designed for all bearings and rotating parts in a horizontal position with a bore diameter over 85 mm with a maximum outside diameter of **1550 mm** and a maximum weight of **1200 kg**.

##### • Ability to control the heating time to achieve a steady temperature rise and avoid stressing the bearing.

##### • The device can be started and stopped remotely by means of a remote control, protecting the operator from excessive exposure to the magnetic field.

*Delivered as standard with the core bar for bore diameters of 215 mm or greater. Three other available yoke sizes are available as an option and may be ordered to suit your particular application.*

#### COMMERCIAL REFERENCE

TOOL SAFE THERM 1200 / Induction heater

### ACCESSORIES



A lifting device is offered for use with the Safe Therm 700 and 1200.

39

Delivered as an option with the device and is extremely useful in intensive applications and the handling of heavy core bars.

#### COMMERCIAL REFERENCE

TOOL FT (Capacity) LIFTING DEVICE

Both the Safe Therm 700 and 1200 can be supplied in a mobile version.

### SPECIAL PRODUCTS

NTN-SNR is able to design machines, specially adapted to your application.



This device, especially developed for a wind turbine application, is capable of heating to 120°C in 60 minutes, parts weighing up to 10 tonnes with an outside diameter of 4 metres.

Thus, the dimensions and performance of our bearing heaters (Fast Therme 150 to Safe Therm 1200) can be modified to match precisely the **geometry** of your parts, your **production patterns** and to the **power supplies** of your workshops.

Customised equipment can also be developed for your large metal parts, such as for wind turbine and railway applications.

We can provide you with a quotation based on the following information:

- The weight of the part to be heated (min/max).
- The dimensions of the part (min/max bore, max. outside diameter, max thickness).
- Electrical power and voltage available.
- Temperature to be achieved.
- Desired heating time or production pattern.

## GOOD PRACTICES FOR MECHANICAL DISMOUNTING

Take care when dismantling: look after your equipment and save time, while working safely.

*Note, the dismantling of bearings is a delicate operation, both for the operator and for the mechanical items involved.*

*If mounting requires a lot of know-how, the risks involved in dismantling cannot be ignored, even if the bearing is to be scrapped.*

*By opting for the correct methods and tools, you reduce the risk of personal injury and damaging parts (shaft, housing, even the bearing, if it is to be re-used).*

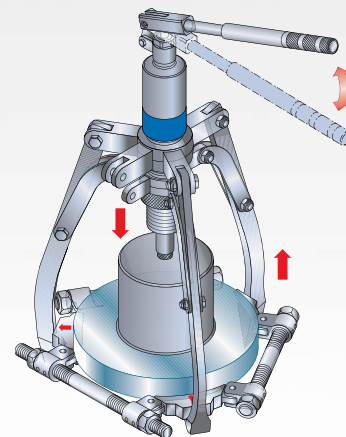
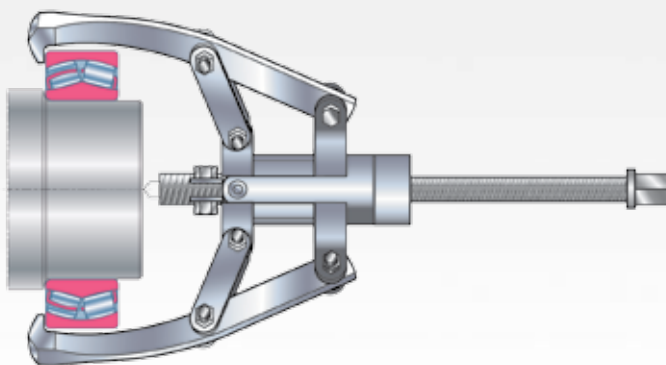
*The two main principles for dismantling are mechanical and hydraulic.*

## OUR RECOMMENDATIONS FOR MECHANICAL DISMOUNTING

Whenever possible; apply the withdrawal force to the ring with the interference fit.

There are numerous types of extractor, depending on the grip offered by the bearing, its accessibility and the extraction force required.

Extractors equipped with a pump and hydraulic cylinder allow the operator to develop very high extraction efforts, using their own muscular strength. They are easy to use, due to the fact that their arms are self-centering.



### THE PROPER QUESTIONS TO BE ASKED

- How do I grip the part?  
Selection of the type of grip: external, internal or special.
- What is the diameter of the part to be extracted?  
Enables the span, spread and force to be defined.
- How do I pull on the part?  
Choice of a support point: on the central shaft, on the outside of the part or using extraction accessories.

## BORE PULLER KITS

Puller kits for internal gripping of the bore. For quick and easy dismounting of bearings tightly mounted in a housing.

41



BP Set 5-44



BP Set 45-100

## APPLICATIONS

Ideal selection of high-strength extractors with braces for extraction via the bore:

- Bearing whose outer ring is a tight fit in its housing.
- Outer rings or rings with well locked packing.

## ADVANTAGES

## Practical

- The BP Set 5-44 has a thrust bolt fitted with a handle facilitating the grip for the hand, as well as a slide hammer.
- Each kit contains several pullers that adapt to each of your applications.
- The case for small bearings combines an adjustable counter support and a slide hammer offering you the choice of extraction mode.

## Reliable and safe

- The unique design of adjustable puller blocks enables successful and safe dismounting, without risk of jacking over and without forces.
- Each part is made of high quality steel, robust and resistant to impact, ensuring product longevity.

## Flexible

- BP Set 5-44 includes 7 pullers for extractions of 5 to 44 mm bore diameters.
- BP Set 45-100 includes 3 pullers for extractions of 45 to 100 mm bore diameters.

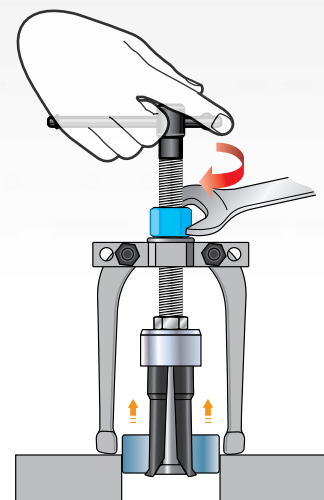
## COMMERCIAL REFERENCE

TOOL BP Set 5-44 / Bore puller set

TOOL BP Set 45-100 / Bore puller set

Slide hammer  
for BP Set 5-44

Clamp



## DEEP-GROOVE BALL BEARINGS PULLER KIT

For quick and easy extraction of your deep-groove ball bearings housed in blind bearings.

42



BBPS 10-100

### APPLICATIONS

This puller kit is specially adapted to carry out, without dismantling your machine, extractions of bearings that are difficult to access, such as:

- Bearings housed in blind bearings,
- Bearings installed on shafts,
- Bearings with a tight fit on outer or inner rings.

### ADVANTAGES

#### Practical and easy

- The kit contains 3 O-rings to facilitate the assembly of your tool.
- The marking of parts along with the selection table included enables a quick selection of accessories to be used.
- The visual user guide favours the correct implementation of the tool.

#### Reliable and safe

- The design of tools enables successful and safe dismounting, without risk of jacking over and without forces.
- Each component is made of high quality steel, robust and resistant to impact, ensuring product longevity.

#### Flexible

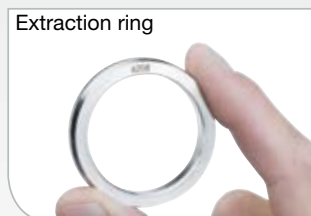
- The case includes 3 different sizes of shafts and 28 puller arms providing a very wide range of applications.
- The kit enables extraction of bearings of 10 to 100 mm bore diameter.

### COMMERCIAL REFERENCE

TOOL BBPS 10-100 / Ball bearing puller set



Prong



Extraction ring



Puller

2/3 PRONGS SELF-CENTERING  
MECHANICAL PULLER

A simple, robust and efficient range of pullers for an easy and safe dismounting of small or medium size bearings.

43



SCMP - 3 arms



SCMP - 2 arms



## APPLICATIONS

Is also well suited to removing pulleys, toothed wheels, flywheels fixed to a shaft.

## ADVANTAGES

## Practical

- The self-centering mechanism ensures the simultaneous positioning of the puller's arms on the bearing.
- Compact and ergonomic, it may be easily operated in every position by one person.

## Safe

- Self-locking system prevents the arms from bending or slipping.
- The greater the extraction force, the tighter the jaws grip the part.
- Robust, designed in hardened steel for maximum strength.

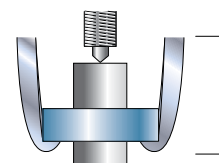
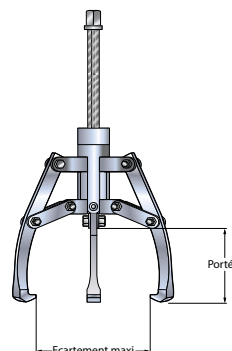
## Multiple uses

- Quickly convertible to two or three claws, depending on the space available.
- Three available models for selection according to the outside diameter of the parts to be extracted and the required reach.

| Maximum spread<br>(mm) | Maximum span<br>(mm) | Capacity<br>(tons) |
|------------------------|----------------------|--------------------|
| 120                    | 80                   | 2                  |
| 180                    | 120                  | 3                  |
| 270                    | 160                  | 5                  |

## COMMERCIAL REFERENCE

TOOL SCMP 2/3-120 / Self-center mech puller  
TOOL SCMP 2/3-180 / Self-center mech puller  
TOOL SCMP 2/3-270 / Self-center mech puller



## 2/3 PRONGS SELF-CENTERING HYDRAULIC PULLER

43

A range of powerful tools for very easy and risk-free dismounting of large bearings and press fitted parts such as pulleys and toothed wheels.

### APPLICATIONS

The self-centering device facilitates positioning and anchoring around the bearing. The power developed by the hydraulic system allows the part to be extracted safely with very little effort.

### ADVANTAGES

#### Practical

- Ready-to-use in a strong case. No assembly of the jaws required before use.
- Compact: the hydraulic pump is built-in. No need for a separate pump, hose or spindle.
- Ergonomic: pump handle pivoting through 360°, allowing the extractor to be used in the most comfortable position. Telescopic, it provides optimum transmission of the effort.
- Easy centering of the piston on the shaft with retractable, integrated point.
- A piston extension is supplied for use with a remote support surface.
- A piston return device makes it ready immediately for further use.
- Long stroke of hydraulic spindle facilitates dismounting in one operation.

#### Multiple uses

- Possibility to change between two or three jaws, depending on the accessibility of the bearing.
- Available in three versions, depending on the power and size required: 4, 12, 20 and 30 tons.

| Capacity (tonnes) | Maximum spread (mm) | Maximum span (mm) | Cylinder stroke (mm) |
|-------------------|---------------------|-------------------|----------------------|
| 4                 | 325                 | 190               | 60                   |
| 12                | 485                 | 305               | 85                   |
| 20                | 570                 | 365               | 111                  |
| 30                | 680                 | 465               | 111                  |

- For the 4 and 12-tonne capacity, an accessory kit consisting of a puller block, connecting rods and a set of bearings separators increases the number of uses and makes separation easier.

#### Safe

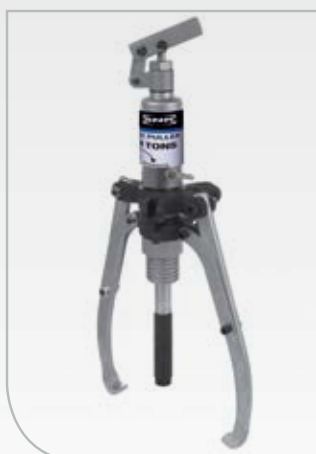
- A safety relief valve prevents any risk of overloading and limits the force applied to the maximum capacity of the equipment.
- A cover protects the user from possible flying bearing fragments. Made of transparent material, it provides good visibility for controlling the extraction.
- The 20 and 30 ton model is equipped with an innovative two-stage pump which makes operation easier and safer.

### COMMERCIAL REFERENCE

TOOL SCHP 4 TONS / Self-center hyd puller  
 TOOL SCHP 12 TONS / Self-center hyd puller  
 TOOL SCHP 20 TONS / Self-center hyd puller  
 TOOL SCHP 30 TONS / Self-center hyd puller



SCHP 4T - 3 arms



SCHP 4T - 2 arms

ACCESSORY CASES  
FOR 4 AND 12-TON SCHP

A strong grip for a safe and easy dismounting.



AS-SCHP 12T

**APPLICATIONS**

A separator is a complementary tool to a claw extractor when the latter does not have sufficient grip. A perfect grip on the back of parts, using bevelled blades, reduces the force necessary for dismounting and avoids damaging the shaft's contact surface

**ADVANTAGES**

- Robust design ensuring a long life for the separation blades.
- After separation by tightening the two blades, turning the separator enables greater force to be used without deforming the blades for the complete extraction of the part.
- Extensions are included to compensate for the distance of the support face.
- Easy centering of the piston on the shaft with integrated point.
- Two versions are available depending on the required power: 4 and 12 tons.

**COMMERCIAL REFERENCE**

TOOL AS-SCHP 4T / acc set hyd puller

TOOL AS-SCHP 12T / acc set hyd puller



AS-SCHP 4T

## UNIVERSAL, TRI-SECTION PULLING PLATE

A strong grip for safe and effective dismounting using a mechanical or hydraulic puller.

44



### APPLICATIONS

The tri-section pulling plate is the complementary tool to the three-armed pullers when the latter does not have sufficient grip. Universal, it is suitable for both the SCHP hydraulic extractor and the SCMP mechanical model.

### ADVANTAGES

- The blades are placed behind the bearing, where the extraction force is most effective.
- The application of the effort on the inner ring minimises the risk of damaging the bearing while preserving the rolling body and the outer ring.
- The tri-section construction distributes the extraction force evenly, preventing the bearing from locking and/or tilting on the shaft during dismounting.

### COMMERCIAL REFERENCE

TOOL BP3S 26-160 / Tri-section back puller  
TOOL BP3S 50-210 / Tri-section back puller  
TOOL BP3S 90-340 / Tri-section back puller  
TOOL BP3S 140-495 / Tri-section back puller



## PULLER-SEPARATOR KIT

For easy and risk-free removal of rings or complete bearings mounted on a shaft and difficult to grasp.

45

Adjustable arms, provided in the kit, also enable extractions by internal or external gripping.

## APPLICATIONS

Allows the extraction of all parts mounted onto a shaft by force, such as pulleys, handwheels and pinions. In order to adapt to your various applications, the adjustable arms will also enable you to dismount:

- Bearings or rings mounted on the shaft (external gripping),
- Bearings or rings jammed in a housing (internal gripping).

## ADVANTAGES

## 2-in-1 tool

- Each case contains a puller block that allows the mounting of the tool for separations as well as extractions.
- The removable arms will allow you to carry out extractions by internal or external gripping.
- A separator for your parts installed on the shaft, as well as a set of removable arms for internal or external gripping, all contained in a single case.

## Powerful and reliable

- The separator is equipped with bevelled blades that ensure excellent grip and thereby avoid any locking.
- With a power of 100 kN, BPES guarantees safe extractions without any degradation to your environment.
- The separator as well as the puller are made of very high quality steel, ensuring the resistance and longevity of your kit.

## Practical

- Thanks to its unique design, BPES 10-105 covers a wide range of applications.
- The kit contains 2 extensions for applications requiring a long span.

## COMMERCIAL REFERENCE

TOOL BPES 10-105/Back puller extract set



Extraction with separator



External grasping extraction

## HYDRAULIC PULLER FOR MOUNTING AND DISMOUNTING

Practical and safe 3-in-1 tool, for mounting and dismantling of bearings and sleeves by internal or external grasping.

45



### APPLICATIONS

Ideal tool for mounting and dismantling a large variety of mounting parts, including bushings, bearings, wheels, gears and pulleys.

The kit, supplied in a steel case, includes:

- An internal gripping puller
- A double-acting hydraulic cylinder: 8 tons for thrust and 12 tons for extraction,
- 3 arms as well as 3 extensions.

### ADVANTAGES

#### Quick and practical

- 3-in-1 tool for a reduced preparation time: same tool used for mounting and dismantling of bearings.
- The single double-acting cylinder ensures a thrust force of 8 tons as well as an extraction of 12 tons.
- Included extensions can be used to attain a greater range.

#### Longevity

- A built-in safety valve enables the tool to operate below rated pressure in order to preserve it over time.

#### Safety

- The built-in safety valve prevents all injuries to the user and all damage to the working environment.
- A self-centering design avoids risk of slipping of the arm during the extraction operation by internal gripping.

### COMMERCIAL REFERENCE

TOOL PUSH/PULLER 8/12 Tons



Internal gripping



Extraction



Thrust

## THE GOOD PRACTICES FOR HYDRAULIC MOUNTING AND DISMOUNTING

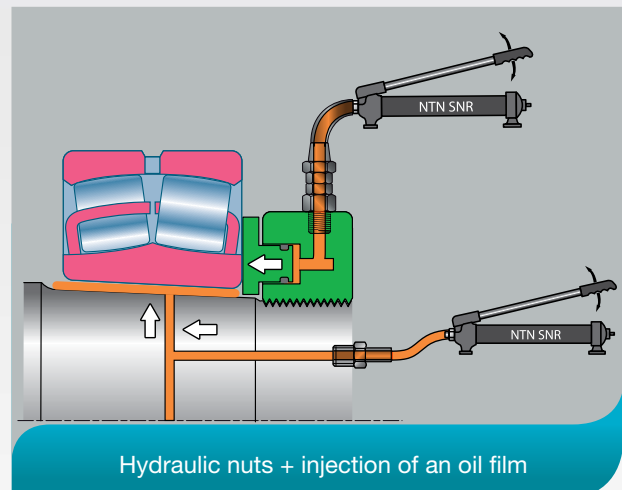
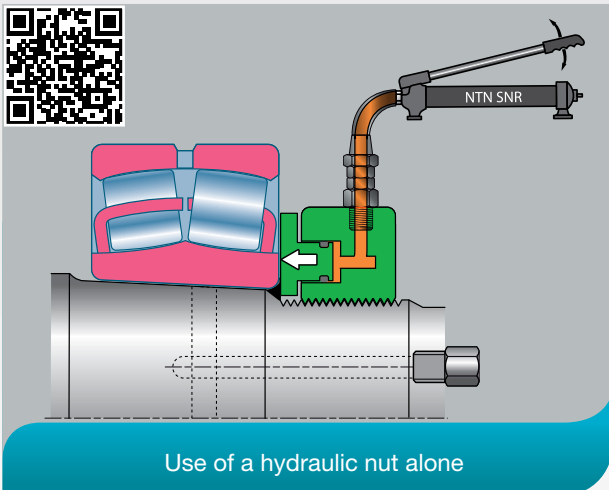
### HYDRAULIC MOUNTING

The mounting of large bearings with tapered bores requires considerable effort that is difficult to produce by mechanical screw tightening. The use of hydraulic technology is required in such cases.

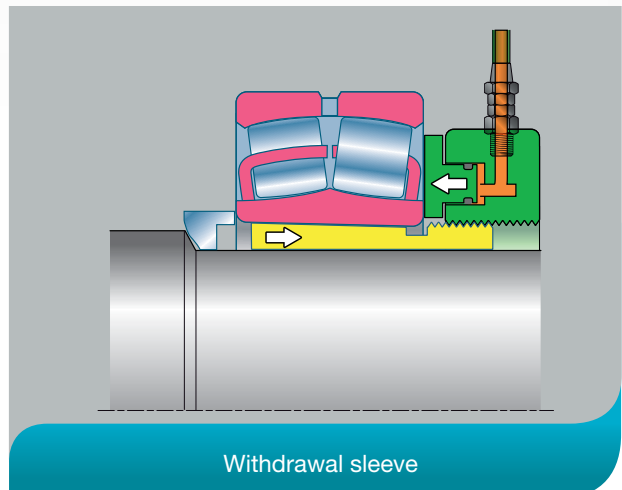
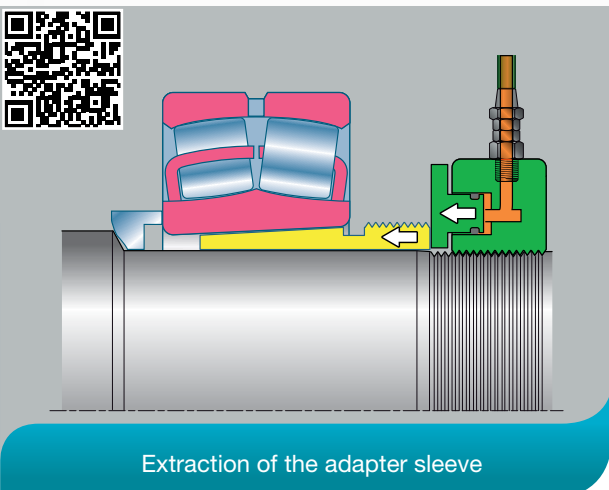
A preliminary solution consists in injecting a oil film over the entire contact area between the shaft and the inner ring. Another solution consists in using a hydraulic nut to develop the necessary mounting force. The two principles may also be used simultaneously to make mounting easier. The residual clearance is checked using feeler gauges or a dial gauge is used to measure the displacement of the bearing along the tapered seat.

Two types of mounting lend themselves to this method

#### TAPERED SEAT SHAFT

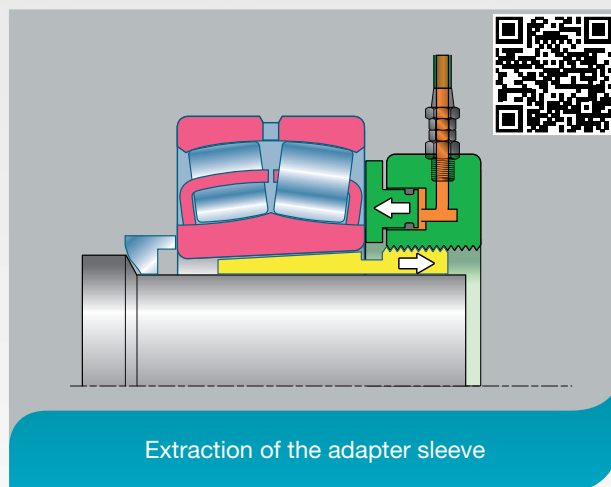
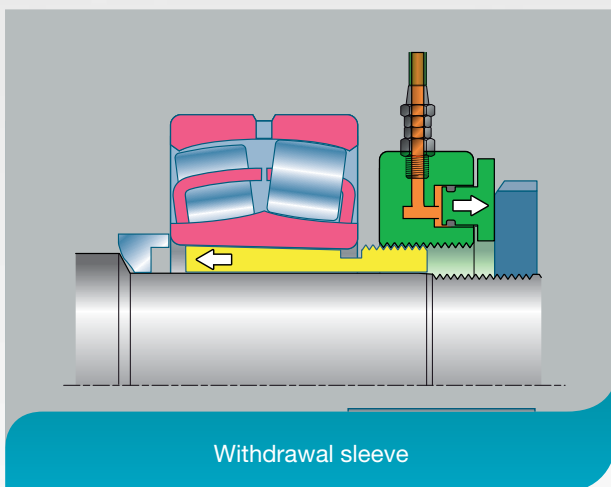
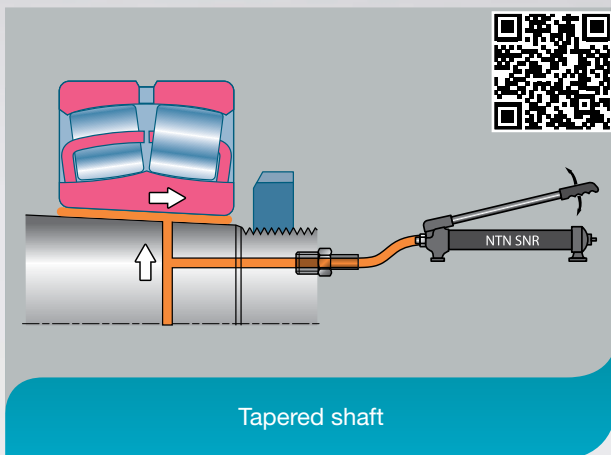


#### SHAFTS WITH A CYLINDRICAL CONTACT SURFACE IN ASSOCIATION WITH A SLEEVE



## HYDRAULIC DISMOUNTING

- If an adapter or withdrawal sleeve was used during mounting, a hydraulic nut can be used for quick and effortless dismounting.
- If hydraulic channels were originally provided in the shaft, the injection of a film of oil on the contact surface between the shaft and the inner ring greatly reduces the effort required.



## HYDRAULIC NUTS

Precise, effortless mounting of your large bearings with a tool that is always ready for use.

46

## APPLICATIONS

Beyond a certain shaft diameter, the mounting or dismounting of a bearing on tapered seatings requires hydraulic assistance.

A hydraulic nut ensures perfect control of the adjustment of the assembly while limiting the use of manual force and reducing the time taken for the operation.

## ADVANTAGES

Besides the hydraulic principle, the “back and forth” design provides unique ease of operation with the automatic return of the thrust plate to its initial position (**design patented by NTN-SNR**)

*“No need to retract the piston manually. This operation is often tedious and subject to oil leaks: the NTN-SNR nut is automatically ready for a new use.”*

- Wide range of sizes: for shafts from 50 mm to 1000 mm in diameter.
- Range also available in standard inch dimensions HMVC from 1,967 to 37,410 inches.
- Special sizes on request.
- Set of spare piston seals supplied as standard.
- The hydraulic nut is equipped with:
  - Two hydraulic connection points, with spot facing for perfect sealing,
  - One quick coupling connection (male) which can be positioned on the front face or on the outside diameter, depending on the ease of access.  
(The 1500 bar high pressure provides maximum safety with a locking stop),
  - One 1500 bar ball valve,
  - 2 holes on the front face are provided for mounting the dial gauge (not included).
- The surface treatment of the nuts provides excellent protection against corrosion and ensures a long working life.
- Easier handling and nut screwing due to:
  - The knurling of the outer surface (all sizes),
  - A bar being supplied and the provision of 4 holes on the outer diameter.  
(For sizes  $\geq$  HMV 50 EBF).
- Easy handling with eye bolts for nut sizes HMV 60 EBF and upwards supplied.

## COMMERCIAL REFERENCE

TOOL HMV (size) EBF / Hydraulic nut (metric)

TOOL HMV (size) EBF / Hydraulic nut (inches)

## OPTIONAL ACCESSORIES

- Dial gauge for the measurement of the displacement of the piston from 5 to 10mm

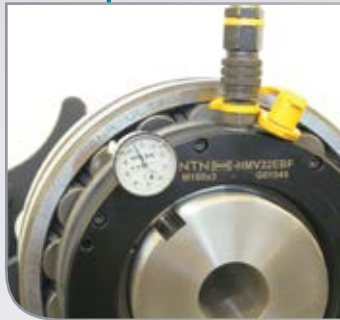
## COMMERCIAL REFERENCE

- TOOL DIAL GAUGE 50
- TOOL DIAL GAUGE 100

- Adaptor kit for the dial gauge

## COMMERCIAL REFERENCE

- TOOL DIAL EXTENSION SET



Tool Dial gauge 50



Tool Dial extension set



## MANUAL HYDRAULIC PUMP KITS

An ultralight high pressure 2-stage hand pump 700 bar (70 MPa) and 1500 bar (150 MPa).

50



TOOL PUMP SET 700B

### APPLICATIONS

These high-pressure pumps are designed for use with automatic return hydraulic nuts or for the mounting and dismounting of bearings coated with an oil film.

Pumps are supplied as standard with the following accessories designed for use at 700 bar and 1500 bar:

- 1 pressure gauge, minimising the risk of overloading,
- 1 high-quality hose (1.5 m for the 700 bar pump with a 0.3 litre reservoir, 3m for the 700 and 1500 bar pumps with a 0.9 litre reservoir),
- 1 quick coupling connection (female) suitable for NTN-SNR hydraulic nuts,
- They are supplied filled with hydraulic oil.

### ADVANTAGES

- Ultra-light, compact design.
- Robust reservoir in composite materials.
- Ergonomic: locking of the lever to facilitate transport
- Robust: pump guaranteed for life under normal conditions of use.
- Efficient: savings in time and effort due to the two stages which allow a reduction of 80% in the number of pump strokes required in comparison with single-stage pumps.
- User safety: electrically isolated lever and safety relief valve.
- Multiple uses: 3 available reservoir sizes:
  - 0.3 litre for nuts  $\leq$  HMV 54 EBF,
  - 0.9 litre for nuts  $\leq$  HMV 92 EBF,
  - 2.5 litres for nuts  $\leq$  HMV 200 EBF (for 1500 bar pump).

### Accessories included for 750 and 1500 bar pumps

- Pressure gauge adaptor for pumps 750b 0.3L and 0.9L.
- Pressure gauge (0-700 bar) or (0-1500 bar)
  - Liquid filled to protect against any sudden loss of pressure,
  - Dual markings in bars / PSI,
  - Fitted with a device protecting against bursting.
- Hose 700 and 1500 bar
  - Very strong thermoplastic, reinforced with layers of woven steel wire,
  - Polyurethane envelope for extreme abrasion resistance,
  - With a rubber protective "handle".
- Quick coupling protection (female) 1500 bars, which provides maximum safety with end stop locking and optimum sealing with a flat face valve.

### Technical characteristics of the hydraulic oil

Contains corrosion inhibitors which do not attack sealing materials such as nitrile.

**Relative density at 15°C:** 0.870 kg/dm<sup>3</sup>  
**Viscosity at 40°C:** 31 cSt  
**Viscosity index:** 102

**Flash point:** 230°C  
**Freezing point:** -36°C

### COMMERCIAL REFERENCE

TOOL PUMP SET 700B - (reservoir capacity) l / Pump with accessories  
 TOOL PUMP SET 1500B - 2.5 L / Pump with accessories  
 TOOL HYDRAULIC OIL 1 L



TOOL HYDRAULIC OIL 1L

### EXTENSION TUBES AND THEIR ADAPTORS



Pipe

In order to allow pressurised oil injection into a sleeve or a shaft with a thick wall, NTN-SNR proposes a range of extension tubes with adaptors, thus enabling to facilitate the extraction of a bearing.

- Maximum pressure = 1500b for greater safety.
- Stainless steel tubes for very high resistance.

#### Pipe

Several sizes available. It can be connected directly to the sleeve.



Adaptor

#### Adaptor

To be selected according to the extension tube diameter.  
It enables to connect the tube to the hydraulic connection (not supplied with the adaptor).



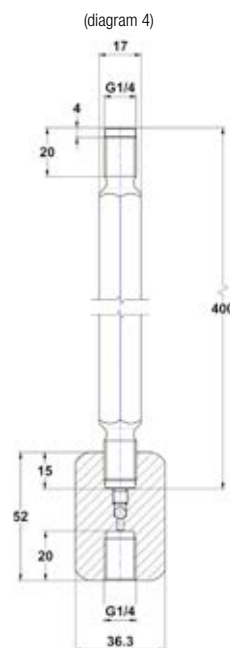
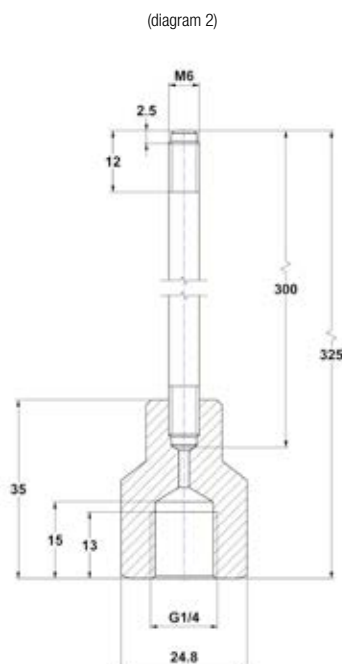
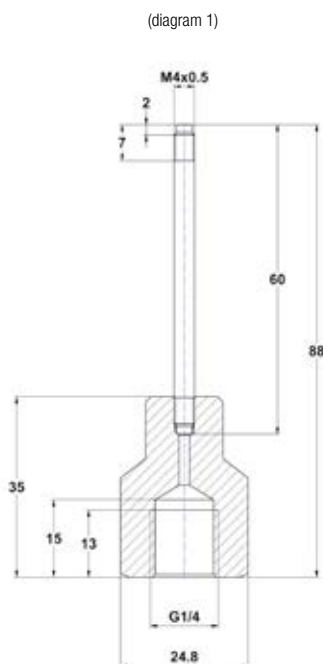
Connection

#### Connection

It is screwed onto the adaptor (G1/4) and can be directly used with our pump kits, TOOL PUMP set 700b and 1500b.

#### Sizes and references

| Sleeve threading  | Pipe                             | Adaptor                             | Connection          |
|-------------------|----------------------------------|-------------------------------------|---------------------|
| M4 (diagram 1)    | TOOL EXTENSION PIPE M4 50 MPA    | TOOL CONNECTING NIPPLE M4 150 MPA   | TOOL HMV NIPPLE 1/4 |
| M6 (diagram 2)    | TOOL EXTENSION PIPE M6 150 MPA   | TOOL CONNECTING NIPPLE M6 150 MPA   |                     |
| G 1/8 (diagram 3) | TOOL EXTENSION PIPE G1/8 150 MPA | TOOL CONNECTING NIPPLE G1/8 150 MPA |                     |
| G 1/4 (diagram 4) | TOOL EXTENSION PIPE G1/4 150 MPA | TOOL CONNECTING NIPPLE G1/4 150 MPA |                     |





# CONTENTS

## SAFETY & MEASUREMENT

### **SAFETY INSTRUMENT**

**P. 32**

Heat-resistant gloves .....P. 32

### **MEASUREMENT INSTRUMENTS**

**P. 32**

Set of calibrated feeler gauges .....P. 32

Infra-red thermometer with laser targeting.....P. 33

## SAFETY INSTRUMENT

### HEAT-RESISTANT GLOVES

Protective gloves to safely handle oily and hot parts of up to + 350° C

52



#### ADVANTAGES

- Made of KEVLAR, they are extremely resistant to tearing, abrasion and cuts.
- Non-inflammable: they provide a high level of protection against contact and convective heat.
- They are tested and certified for mechanical (EN 388) and thermal (EN407) hazards.
- Non-fluffy, they avoid polluting the bearings.
- Extremely comfortable, they are useful for all maintenance work.
- Single size: 10.5.

#### COMMERCIAL REFERENCE

TOOL GLOVE HEAT RESISTANT

## MEASUREMENT INSTRUMENTS

### SET OF CALIBRATED FEELER GAUGES

A simple and precise tool for measuring the clearance between two parts.

52



#### APPLICATIONS

This feeler gauge set allows the quick, accurate measurement of radial clearance, especially on spherical roller and cylindrical bearings. It contains 17 gauges.

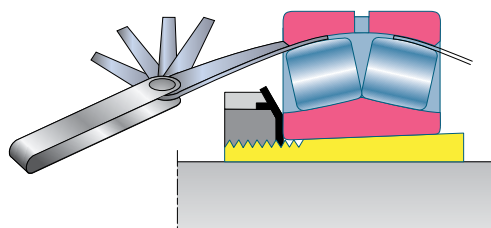
3 versions of the gauge set are offered: 100mm, 150mm and 300 mm long

#### ADVANTAGES

- Set of 17 round end gauges.
- Delivered with a spare set of the thinnest gauge blades.
- Available in 100 mm, 150 mm and 300 mm.
- In a protective steel sleeve.
- Calibrated to 1/100th.

#### COMMERCIAL REFERENCE

FEELER GAUGE TOOL (gauge length)



## LASER TEMP 301 INFRA-RED THERMOMETER WITH LASER TARGETING



Enabling a preliminary diagnosis of the machine operation by means of accurate and safe measurement of the temperature remotely or by contact.

53

### APPLICATIONS

The LASER TEMP 301 thermometer combines safety with accuracy.

- The safety of remote infrared measurement for burning, moving or difficult-to-access objects.
- Accurate measurement using the contact probe.

Its elaborate optical system allows small, remote targets to be measured easily and precisely.

### ADVANTAGES

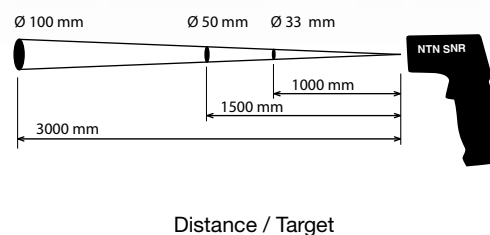
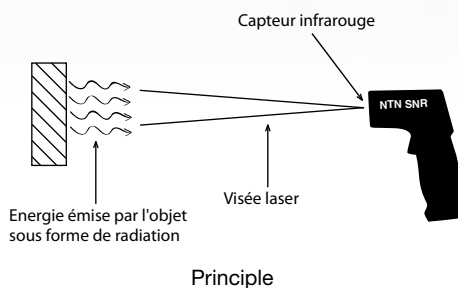
- Wide measurement range in infrared mode:  $-50^{\circ}\text{C}$  to  $+850^{\circ}\text{C}$ .
- High degree of precision, using the:
  - Laser targeting device,
  - The excellent 30:1 distance:target ratio,
  - Emissivity adjustable between 0.1 and 1,
  - Type K thermocouple wire probe.
- Extremely quick measurements: response time less than 1 second.
- Internal memory able to record up to 20 measurements.
- Equipped with the following functions:
  - High / low, visual and audible adjustable alarms,
  - Automatic switch-off to maximise its useful life,
  - Maximum, minimum, difference, average measurement.
- Light, ergonomic gun shape.
- Simple to use, it may be easily configured to work in  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ .
- Back-lit display for easy reading.

Supplied with:

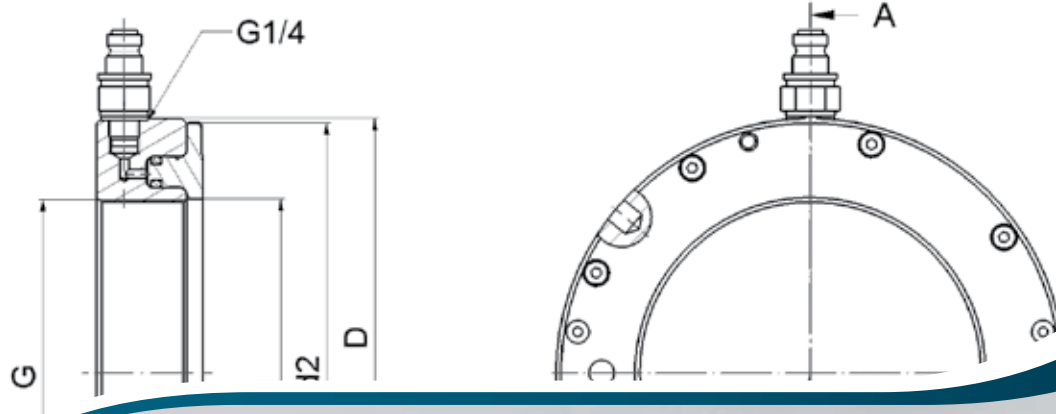
- Type K thermocouple wire probe (range  $-50^{\circ}\text{C}$  to  $+440^{\circ}\text{C}$ , length 1 m),
- Protective pouch - User manual.

### COMMERCIAL REFERENCE

TOOL LASERTEMP 301 / IR Thermometer







# CONTENTS

## TECHNICAL DATA

|                                                         |       |
|---------------------------------------------------------|-------|
| Mounting tool kit case . . . . .                        | P. 36 |
| Anti-fretting paste . . . . .                           | P. 36 |
| Adjustable spanners . . . . .                           | P. 36 |
| Heating equipment . . . . .                             | P. 38 |
| Bore puller kits . . . . .                              | P. 41 |
| Deep-groove ball bearings extractor kit . . . . .       | P. 42 |
| Self-centering mechanical puller . . . . .              | P. 43 |
| Self-centering hydraulic puller . . . . .               | P. 43 |
| Accessory cases . . . . .                               | P. 44 |
| Tri-section pulling plate . . . . .                     | P. 44 |
| Puller - separator kit . . . . .                        | P. 45 |
| Hydraulic puller for mounting and dismounting . . . . . | P. 45 |
| Hydraulic nuts . . . . .                                | P. 46 |
| Manual hydraulic pump kits . . . . .                    | P. 50 |
| Heat-resistant gloves . . . . .                         | P. 52 |
| Set of calibrated feeler gauges . . . . .               | P. 52 |
| Infra-red thermometer with laser targeting . . . . .    | P. 53 |

## COLD MOUNTING TOOL KIT CASE

> P 9

|                               |                                                                              |
|-------------------------------|------------------------------------------------------------------------------|
| Reference                     | <b>TOOL IFT SET 33 / Industry Fitting Tool Set</b>                           |
| Description                   | Mounting tool kit                                                            |
| Application                   | Cold mounting of bearings:<br>bore Ø: 10 to 50 mm<br>outside Ø: 26 to 110 mm |
| Contents                      | 33 Impact rings<br>3 Mounting sleeves<br>1 Dead-blow mallet (weight 0.7 kg)  |
| Material                      | Socket machined from strong, solid material                                  |
| Case dimensions               | 430 x 320 x 100 mm                                                           |
| Weight of kit, including case | 4.8 kg                                                                       |

## ANTI-FRETTING PASTE B 750G / T 60G

> P 11

|                                    |                                |
|------------------------------------|--------------------------------|
| References                         | <b>LUB ANTI FRETTING PASTE</b> |
| Density                            | 1.23                           |
| Colour                             | Whitish                        |
| Texture                            | Smooth                         |
| Base oil                           | Synthetic                      |
| Nature of thickener                | Lithium soap                   |
| NLGI consistency                   | 1                              |
| Temperature range for use          | -40°C to +150°C                |
| Viscosity of the base oil at 40°C, | 350 mm²/s                      |
| Flash point                        | > 200°C                        |
| Drop point DIN ISO 2176            | > 185°C                        |
| Packaging                          | Tube 60 g - box 750 g          |

## ADJUSTABLE SPANNERS

> P 11

|                 |                                                                |                      |
|-----------------|----------------------------------------------------------------|----------------------|
| Reference       | <b>TOOL PS (size) / Pin spanner</b>                            |                      |
| Description     | Articulated manual pin spanner                                 |                      |
| Material        | Hardened, forged chrome vanadium steel.<br>Satin chrome finish |                      |
| Pin hardness    | 40 HRC                                                         |                      |
| Use             | Tommy nuts (examples of accuracy: TB, TBR, TBP, TBPR, etc.)    |                      |
| References      | Nut diameter<br>(mm)                                           | Pin diameter<br>(mm) |
| TOOL PS 15-35   | 15-35                                                          | 3                    |
| TOOL PS 35-50   | 35-50                                                          | 4                    |
| TOOL PS 50-80   | 50-80                                                          | 5                    |
| TOOL PS 80-120  | 80-120                                                         | 6                    |
| TOOL PS 120-180 | 120-180                                                        | 8                    |
| References      | <b>TOOL HS (size) / Hook spanner</b>                           |                      |
| Description     | Articulated manual hook spanner                                |                      |
| Material        | Hardened, forged chrome vanadium steel.<br>Satin chrome finish |                      |
| Use             | Slot nuts (e.g.: KM, KML, ..., B, BR, BP,...)                  |                      |
| References      | Nut diameter<br>(mm)                                           |                      |
| TOOL HS 15-35   | 15-35                                                          |                      |
| TOOL HS 35-50   | 35-50                                                          |                      |
| TOOL HS 50-80   | 50-80                                                          |                      |
| TOOL HS 80-120  | 80-120                                                         |                      |
| TOOL HS 120-180 | 120-180                                                        |                      |

# PRECISION NUT CROSS REFERENCE/tommy nut and slot nut spanners

|                   | Spanner 15-35 (mm) |          | Spanner 35-50 (mm) |             | Spanner 50-80 (mm) |         | Spanner 80-120 (mm) |         | Spanner 120-180 (mm) |          |
|-------------------|--------------------|----------|--------------------|-------------|--------------------|---------|---------------------|---------|----------------------|----------|
|                   | Hook               | Pin      | Hook               | Pin         | Hook               | Pin     | Hook                | Pin     | Hook                 | Pin      |
| B and TB nuts     | B 20/1             | B 20/1   | B 25               | TB 25       | B 35               | TB 35   | B 60                | TB 60   | B 90                 | TB 90    |
|                   | TB 90              | B 20/1.5 | B 30               | TB 30       | B 40               | TB 40   | B 65                | TB 65   | B 95                 | TB 95    |
|                   | -                  | -        | -                  | -           | B 45               | TB 45   | B 70                | TB 70   | B 100                | TB 100   |
|                   | -                  | -        | -                  | -           | B 50               | TB 50   | B 75                | TB 75   | -                    | -        |
|                   | -                  | -        | -                  | -           | B 55               | TB 55   | B 80                | TB 80   | -                    | -        |
|                   | -                  | -        | -                  | -           | B 60               | TB 60   | B 85                | TB 85   | -                    | -        |
|                   | -                  | -        | -                  | -           | -                  | -       | B 90                | TB 90   | -                    | -        |
| BP and TBP nuts   | -                  | -        | BP 20/1            | TBP 20/1    | BP 30              | TBP 30  | BP 55               | TBP 55  | BP 75                | TBP 75   |
|                   | -                  | -        | BP 20/1.5          | TBP 20/1.5  | BP 35              | TBP 35  | BP 60               | TBP 60  | BP 80                | TBP 80   |
|                   | -                  | -        | BP 25              | TBP 25      | BP 40              | TBP 40  | BP 65               | TBP 65  | BP 85                | TBP 85   |
|                   | -                  | -        | -                  | -           | BP 45              | TBP 45  | BP 70               | TBP 70  | BP 90                | TBP 90   |
|                   | -                  | -        | -                  | -           | BP 50              | TBP 50  | -                   | -       | BP 95                | TBP 95   |
|                   | -                  | -        | -                  | -           | -                  | -       | -                   | -       | BP 100               | TBP 100  |
| BR and TBR nuts   | -                  | -        | BR 25              | TBR 25      | BR 35              | TBR 35  | BR 60               | TBR 60  | BR 90                | TBR 90   |
|                   | -                  | -        | BR 30              | TBR 30      | BR 40              | TBR 40  | BR 65               | TBR 65  | BR 95                | TBR 95   |
|                   | -                  | -        | -                  | -           | BR 45              | TBR 45  | BR 70               | TBR 70  | BR 100               | TBR 100  |
|                   | -                  | -        | -                  | -           | BR 50              | TBR 50  | BR 75               | TBR 75  | -                    | -        |
|                   | -                  | -        | -                  | -           | BR 55              | TBR 55  | BR 80               | TBR 80  | -                    | -        |
|                   | -                  | -        | -                  | -           | BR 60              | TBR 60  | BR 85               | TBR 85  | -                    | -        |
|                   | -                  | -        | -                  | -           | -                  | -       | BR 90               | TBR 90  | -                    | -        |
| BPR and TBPR nuts | -                  | -        | BPR 20/1           | TBPR 20/1   | BPR 30             | TBPR 30 | BPR 55              | TBPR 55 | BPR 75               | TBPR 75  |
|                   | -                  | -        | BPR 20/1.5         | TBPR 20/1.5 | BPR 35             | TBPR 35 | BPR 60              | TBPR 60 | BPR 80               | TBPR 80  |
|                   | -                  | -        | BPR 25             | TBPR 25     | BPR 40             | TBPR 40 | BPR 65              | TBPR 65 | BPR 85               | TBPR 85  |
|                   | -                  | -        | -                  | -           | BPR 45             | TBPR 45 | BPR 70              | TBPR 70 | BPR 90               | TBPR 90  |
|                   | -                  | -        | -                  | -           | BPR 50             | TBPR 50 | -                   | -       | BPR 95               | TBPR 95  |
|                   | -                  | -        | -                  | -           | -                  | -       | -                   | -       | BPR 100              | TBPR 100 |

# KM NUT CROSS REFERENCE/pin tightening spanner

| Spanner 15-35 (mm) | Spanner 35-50 (mm) | Spanner 50-80 (mm) | Spanner 80-120 (mm) | Spanner 120-180 (mm) |
|--------------------|--------------------|--------------------|---------------------|----------------------|
| TOOL HS 15-35      | TOOL HS 35-50      | TOOL HS 50-80      | TOOL HS 80-120      | TOOL HS 120-180      |
| KM 0               | KM 5               | KM 7               | KM 12               | KM 18                |
| KM 1               | KM 6               | KM 8               | KM 13               | KM 19                |
| KM 2               | -                  | KM 9               | KM 14               | KM 20                |
| KM 3               | -                  | KM 10              | KM 15               | KM 21                |
| KM 4               | -                  | KM 11              | KM 16               | KM 22                |
| -                  | -                  | KM 12              | KM 17               | KM 23                |
| -                  | -                  | -                  | KM 18               | KML 24               |
| -                  | -                  | -                  | -                   | KM 24                |
| -                  | -                  | -                  | -                   | KM 25                |
| -                  | -                  | -                  | -                   | KML 26               |
| -                  | -                  | -                  | -                   | KML 27               |
| -                  | -                  | -                  | -                   | KML 28               |
| -                  | -                  | -                  | -                   | KML 28               |
| -                  | -                  | -                  | -                   | -                    |

## HEATING APPARATUS - TOOL FAST THERM (SIZE) / INDUCTION HEATER

► P 14/15

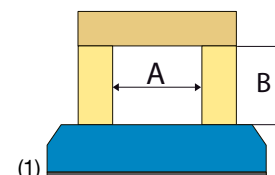
| TECHNICAL DATA                                 | FAST THERM 20                      | FAST THERM 35                       | FAST THERM 150                      | FAST THERM 300                       |
|------------------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| <b>ELECTRICITY</b>                             |                                    |                                     |                                     |                                      |
| Maximum power consumption                      | 3,6 kVA                            | 3,6 kVA                             | 12,8 kVA                            | 12,8 kVA                             |
| Maximum voltage/current                        | 230 V / 16 A                       | 230 V / 16 A                        | 400 V / 32 A                        | 400 V / 32 A                         |
| Frequency                                      | 50 Hz                              | 50 Hz                               | 50 Hz                               | 50 Hz                                |
| Other voltages on request                      | 110 V to 240 V                     | 110 V to 240 V                      | 230 V/ 500 V/ 560 V                 | 230 V/ 500 V/ 560 V                  |
| Other frequencies on request                   | 60 Hz                              | 60 Hz                               | 60 Hz                               | 60 Hz                                |
| <b>CONTROL</b>                                 |                                    |                                     |                                     |                                      |
| Temperature adjustment                         | + 40°C to + 240°C                  | + 40°C to + 240°C                   | + 40°C to + 240°C                   | + 40°C to + 240°C                    |
| Heating time adjustment<br>Maximum temperature | no<br>-                            | 0-99 min.<br>+ 240°C                | 0-99 min.<br>+ 240°C                | 0-99 min.<br>• + 240°C<br>◦ + 400 °C |
| Temperature probe<br>Reference: TOOL +         | •<br>TEMP PROBE 400 <sup>(+)</sup> | •<br>TEMP PROBE 1000 <sup>(+)</sup> | •<br>TEMP PROBE 1000 <sup>(+)</sup> | •<br>TEMP PROBE 1000 <sup>(+)</sup>  |
| Temperature control precision                  | +/- 2°C                            | +/- 2°C                             | +/- 2°C                             | +/- 2°C                              |
| Temperature holding at the end of cycle        | •                                  | •                                   | •                                   | •                                    |
| Demagnetising                                  | Automatic                          | Automatic                           | Automatic                           | Automatic                            |
| Residual magnetism                             | < 2 A / cm                         | < 2 A / cm                          | < 2 A / cm                          | < 2 A / cm                           |
| Audible signal                                 | •                                  | •                                   | •                                   | •                                    |
| <b>APPLIANCE DESIGN</b>                        |                                    |                                     |                                     |                                      |
| Dimensions (L x W x H) (mm)                    | 345 x 200 x 240                    | 420 x 260 x 360                     | 505 x 260 x 440                     | 1060 x 500 x 1090                    |
| Space between pivots A and B <sup>(1)</sup>    | 120 x 100 mm                       | 180 x 180 mm                        | 210 x 200 mm                        | 330 x 260 mm                         |
| Weight (vertical yoke)                         | 17 kg                              | 35 kg                               | 54 kg                               | 75 kg (trolley included)             |
| Pivoting arm                                   | no                                 | •                                   | •                                   | •                                    |
| Shelf trolley                                  | no                                 | no                                  | no                                  | •                                    |
| <b>PARTS TO BE HEATED</b>                      |                                    |                                     |                                     |                                      |
| Maximum weight <sup>(++)</sup>                 | 40 kg                              | 70 kg                               | 150 kg (horizontal)                 | 300 kg (horizontal)                  |
| Minimum bore diameter (")                      | 10 mm                              | 15 mm                               | 30 mm                               | 30 mm                                |
| Maximum external diameter                      | 280 mm                             | 410 mm                              | 490 mm                              | 740 mm                               |
| Maximum width                                  | 120 mm                             | 180 mm                              | 210 mm                              | 330 mm                               |
| <b>STANDARD AND OPTIONAL EQUIPMENT</b>         |                                    |                                     |                                     |                                      |
| Bearing bore Ø ≥                               | References: TOOL <sup>(+++)</sup>  |                                     |                                     |                                      |
| 10 mm                                          | ◦ FT20-YOKE 10                     |                                     |                                     |                                      |
| 15 mm                                          | ◦ FT20-YOKE 15                     | ◦ FT35-YOKE 15                      |                                     |                                      |
| 20 mm                                          | • FT20-YOKE 20                     | ◦ FT35-YOKE 20                      |                                     |                                      |
| 30 mm                                          |                                    |                                     | ◦ FT150-YOKE 30                     | ◦ FT300-YOKE 30                      |
| 35 mm                                          | • FT20-YOKE 35                     | ◦ FT35-YOKE 35                      |                                     |                                      |
| 45 mm                                          |                                    |                                     | ◦ FT150-YOKE 45                     | ◦ FT300-YOKE 45                      |
| 60 mm                                          | • FT20-YOKE 60                     | ◦ FT35-YOKE 60                      | ◦ FT150-YOKE 60                     | ◦ FT300-YOKE 60                      |
| 70 mm                                          |                                    | • FT35-YOKE 70                      | ◦ FT150-YOKE 70                     | ◦ FT300-YOKE 70                      |
| 85 mm                                          |                                    |                                     | ◦ FT150-YOKE 85                     | ◦ FT300-YOKE 85                      |
| 100 mm                                         |                                    |                                     | • FT150-YOKE 100                    | ◦ FT300-YOKE 100                     |
| 115 mm                                         |                                    |                                     |                                     | • FT300-YOKE 115                     |

• Standard / ◦ Optional equipment

(+) with min. yoke size / (+++) example: TOOL FT 35-YOKE 20

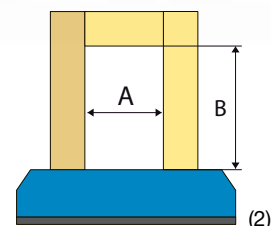
(+): length of probe wire (e.g. 400: 400 = 400 mm)

(++): for bearings. For other parts, please contact us.



# HEATING APPARATUS - TOOL SAFE THERM (size) / Induction Heater ➤ P 15/16

| TECHNICAL DATA                                 | SAFE THERM 700                       | SAFE THERM 1200                      |
|------------------------------------------------|--------------------------------------|--------------------------------------|
| <b>ELECTRICITY</b>                             |                                      |                                      |
| Maximum power consumption                      | 25 kVA                               | 40 kVA                               |
| Maximum voltage/current                        | 400 V / 63 A                         | 400 V / 100 A                        |
| Frequency                                      | 50 Hz                                | 50 Hz                                |
| Other voltages on request                      | 230 V/ 500 V/ 560 V                  | 230 V/ 500 V/ 560 V                  |
| Other frequencies on request                   | 60 Hz                                | 60 Hz                                |
| <b>CONTROL</b>                                 |                                      |                                      |
| Temperature adjustment                         | +40°C to + 240°C                     | +40°C to + 240°C                     |
| Heating time adjustment<br>Maximum temperature | 0-99 min.<br>• + 240°C<br>◦ + 400 °C | 0-99 min.<br>• + 240°C<br>◦ + 400 °C |
| Temperature probe<br>Reference: TOOL +         | •<br>TEMP PROBE 1000 <sup>(+)</sup>  | •<br>TEMP PROBE 1500 <sup>(+)</sup>  |
| Temperature control precision                  | +/- 2°C                              | +/- 2°C                              |
| Temperature holding at the end of cycle        | •                                    | •                                    |
| Demagnetising                                  | Automatic                            | Automatic                            |
| Residual magnetism                             | < 2 A / cm                           | < 2 A / cm                           |
| Audible signal                                 | •                                    | •                                    |
| <b>APPLIANCE DESIGN</b>                        |                                      |                                      |
| Dimensions (L x W x H) mm                      | 780 x 1200 x 1060 <sup>(*)</sup>     | 1200 x 1700 x 1250 <sup>(*)</sup>    |
| Space between pivots A and B <sup>(2)</sup>    | 390 x 430 mm <sup>(*)</sup>          | 680 x 470 mm <sup>(*)</sup>          |
| Weight (vertical yoke)                         | 280 kg                               | 850 kg                               |
| Pivoting arm                                   | No (Vertical bar)                    | No (Vertical bar)                    |
| Bar lifting device<br>Reference: TOOL +        | ◦<br>FT600-Lifting Device            | ◦<br>FT1200-Lifting Device           |
| <b>PARTS TO BE HEATED</b>                      |                                      |                                      |
| Maximum weight <sup>(++)</sup>                 | 700 kg (horizontal)                  | 1200 kg (horizontal)                 |
| Minimum bore diameter <sup>(*)</sup>           | 45 mm                                | 85 mm                                |
| Maximum external diameter                      | 900 mm <sup>(*)</sup>                | 1550 mm <sup>(*)</sup>               |
| Maximum width                                  | 410 mm <sup>(*)</sup>                | 440 mm <sup>(*)</sup>                |
| <b>STANDARD AND OPTIONAL EQUIPMENT</b>         |                                      |                                      |
| Bearing bore Ø ≥                               | References: TOOL <sup>(...)</sup>    |                                      |
| 20 mm                                          |                                      |                                      |
| 30 mm                                          |                                      |                                      |
| 35 mm                                          |                                      |                                      |
| 45 mm                                          | ◦ ST700-YOKE 45                      |                                      |
| 60 mm                                          | ◦ ST700-YOKE 60                      |                                      |
| 70 mm                                          | ◦ ST700-YOKE 70                      |                                      |
| 85 mm                                          | ◦ ST700-YOKE 85                      | ◦ ST1200-YOKE 85                     |
| 100 mm                                         | ◦ ST700-YOKE 100                     |                                      |
| 115 mm                                         | ◦ ST700-YOKE 115                     | ◦ ST1200-YOKE 115                    |
| 130 mm                                         | ◦ ST700-YOKE 130                     |                                      |
| 145 mm                                         | • ST700-YOKE 145                     | ◦ ST1200-YOKE 145                    |
| 215 mm                                         |                                      | • ST1200-YOKE 215                    |



- Standard / ◦ Optional equipment
- (+) with min. yoke size/ (\*\*) other dimensions upon request
- (\*\*\*) example: TOOL FT 35-YOKE 20
- (+): length of probe wire (e.g. 400: 400 = 400 mm)
- (++): for bearings. For other parts, please contact us.

## DIMENSIONS (MM) AND WEIGHT (KG) OF BARS

➤ P 14 - 16

|      | FT20                 | FT35                | FT150                | FT300                | ST700                | ST1200                 |
|------|----------------------|---------------------|----------------------|----------------------|----------------------|------------------------|
| Y10  | 7x7x200<br>0.08 Kg   |                     |                      |                      |                      |                        |
| Y15  | 10x10x200<br>0.15 Kg | 10x10x280<br>0.2 Kg |                      |                      |                      |                        |
| Y20  | 14x14x200<br>0.3 kg  | 14x14x280<br>0.4 kg |                      |                      |                      |                        |
| Y30  |                      |                     | 20x20x350<br>1.1 kg  | 20x20x490<br>1.5 kg  |                      |                        |
| Y35  | 25x25x200<br>0.9 kg  | 25x25x280<br>1.3 kg |                      |                      |                      |                        |
| Y45  |                      |                     | 30x30x350<br>2.4 kg  | 30x30x490<br>3.3 kg  | 30x30x700<br>4.7 kg  |                        |
| Y60  | 40x40x200<br>2.5 kg  | 40x40x280<br>3.4 kg | 40x40x350<br>4.2 kg  | 40x40x490<br>5.9 kg  | 40x40x700<br>8.4 kg  |                        |
| Y70  |                      | 50x50x280<br>5.3 kg | 50x50x350<br>6.6 kg  | 50x50x490<br>9.2kg   | 50x50x700<br>13.8 kg |                        |
| Y85  |                      |                     | 60x60x350<br>9.4 kg  | 60x60x490<br>13.2 kg | 60x60x700<br>19.5 kg | 60x60x850<br>24 kg     |
| Y100 |                      |                     | 70x70x350<br>12.8 kg | 70x70x490<br>18 kg   | 70x70x700<br>26.9 kg |                        |
| Y115 |                      |                     |                      | 80x80x490<br>23.5 kg | 80x80x700<br>35 kg   | 80x80x850<br>42.7 kg   |
| Y130 |                      |                     |                      |                      | 90x90x700<br>44.5 kg |                        |
| Y145 |                      |                     |                      |                      | 100x100x700<br>55 kg | 100x100x850<br>66.8 kg |
| Y215 |                      |                     |                      |                      |                      | 150x150x850<br>150 kg  |

# BORE PULLER KITS (with internal grasping)

➤ P 18

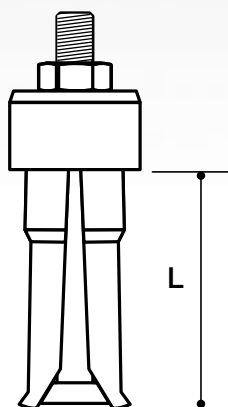
| Reference            | TOOL BP SET (size) / Bore Puller                                          |                                                           |
|----------------------|---------------------------------------------------------------------------|-----------------------------------------------------------|
| Contents             | BP Set 5-44<br>7 clamps<br>1 against adjustable support<br>1 slide hammer | BP Set 45-100<br>3 clamps<br>1 against adjustable support |
| Bore diameter (mm)   | 5 to 44                                                                   | 45 to 100                                                 |
| Case dimensions (mm) | 405 x 345 x 100                                                           | 490 x 500 x 130                                           |
| Case weight (kg)     | 5                                                                         | 12                                                        |
| Capacity (5 tons)    | 50 kN                                                                     | 50 kN                                                     |

## ➤ Description of components of the BP case Set 5-44

| Puller   | For bearing with bore |      | Thread | Length<br>(L - mm) | Weight<br>(g) |
|----------|-----------------------|------|--------|--------------------|---------------|
|          | Min.                  | Max. |        |                    |               |
| BP 5-7   | 5                     | 7    | M8     | 27                 | 60            |
| BP 8-11  | 8                     | 11   | M8     | 40                 | 40            |
| BP 12-15 | 12                    | 15   | M8     | 53                 | 120           |
| BP 16-19 | 16                    | 19   | M8     | 53                 | 140           |
| BP 20-26 | 20                    | 26   | M8     | 55                 | 260           |
| BP 28-34 | 28                    | 34   | M8     | 60                 | 320           |
| BP 35-44 | 44                    | 35   | M8     | 78                 | 410           |

## ➤ Description of components of the BP case Set 45-100

| Puller    | For bearing with bore |      | Thread | Length<br>(L - mm) | Weight<br>(g) |
|-----------|-----------------------|------|--------|--------------------|---------------|
|           | Min.                  | Max. |        |                    |               |
| BP 45-58  | 45                    | 58   | M10    | 91                 | 860           |
| BP 56-75  | 56                    | 75   | M10    | 115                | 2040          |
| BP 74-100 | 74                    | 100  | M10    | 125                | 3140          |



## DEEP-GROOVE BALL BEARING PULLER KIT

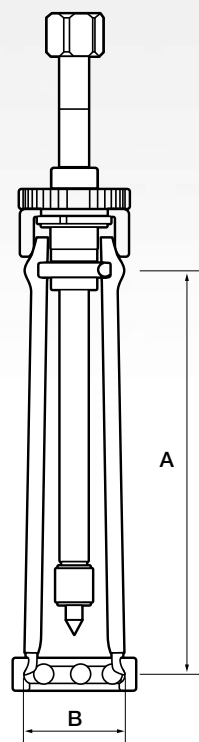
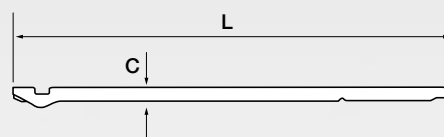
> P 19

| Reference       | TOOL BBPS 10-100 / Ball bearing puller set                             |      |                         |        |                         |             |
|-----------------|------------------------------------------------------------------------|------|-------------------------|--------|-------------------------|-------------|
| Contents        | 3 shafts, 28 arms, 22 metal rings, 3 O-rings, 1 crank, 1 centering pad |      |                         |        |                         |             |
| bore diameter   | For bearing extraction from 10 to 100 mm                               |      |                         |        |                         |             |
| Case dimensions | 490 x 500 x 130 mm                                                     |      |                         |        |                         |             |
| Case weight     | 8.4 kg                                                                 |      |                         |        |                         |             |
| Capacity        | 70 kN (7 tons)                                                         |      |                         |        |                         |             |
| Puller          | For bearing with bore                                                  |      | Dimensions (mm)         |        |                         | Weight (g)  |
|                 | Min.                                                                   | Max. | A                       | C      | L                       |             |
| BBPSA           | 10                                                                     | 25   | A1/A2 - 140<br>A3 - 160 | 5<br>6 | A1/A2 - 160<br>A3 - 180 | 260 - 420   |
| BBPSB           | 20                                                                     | 60   | 170                     | 8      | 196                     | 550 - 820   |
| BBPSC           | 17                                                                     | 100  | 200                     | 10     | 237                     | 1260 - 1800 |

|        |                   |           |                                  |                        |                              |                                      |
|--------|-------------------|-----------|----------------------------------|------------------------|------------------------------|--------------------------------------|
|        |                   | O-ring    |                                  |                        |                              |                                      |
| BBPS A | A1 <sup>(1)</sup> | 28 x 3.00 | 6000*<br>6001*<br>6002*<br>6003* | 6200*                  |                              | 16002*<br>16003*<br>16100*<br>16101* |
|        | A2 <sup>(1)</sup> |           | 6004<br>6005<br>6006             | 6201*<br>6202<br>6203  | 6300                         |                                      |
|        | A3 <sup>(1)</sup> |           |                                  | 6204<br>6205           | 6301<br>6302<br>6303         | 62/22                                |
| BBPS B | B1 <sup>(1)</sup> | 50 x 3.00 | 6007*<br>6008*<br>6009*<br>6010* |                        |                              | 16011*                               |
|        | B2 <sup>(1)</sup> |           | 6011*<br>6012*                   | 6206<br>6207           | 6304<br>6305<br>6306         | 62/28*                               |
| BBPS C | C1 <sup>(1)</sup> | 85 x 3.00 | 6014*<br>6015*                   | 6208<br>6209<br>6210   | 6307                         | 6403                                 |
|        | C2 <sup>(1)</sup> |           | 6018*<br>6019*<br>6020*          | 6211*<br>6212<br>6213* | 6308<br>6309<br>6310<br>6311 | 6404<br>6405<br>6406                 |

\* Bearing not requiring an extraction ring.

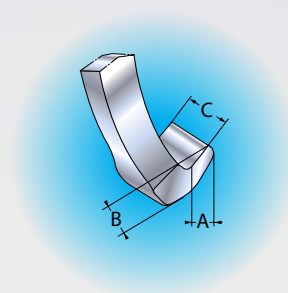
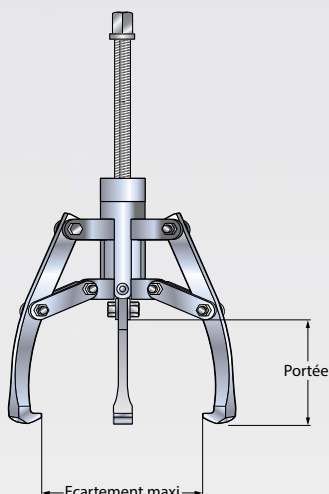
(1) - Our recommendations may change depending on the make of the bearing.



# SELF-CENTERING PULLER (combined with 2/3 arms)

➤ P 20

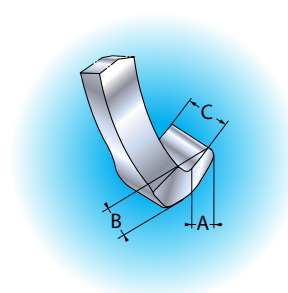
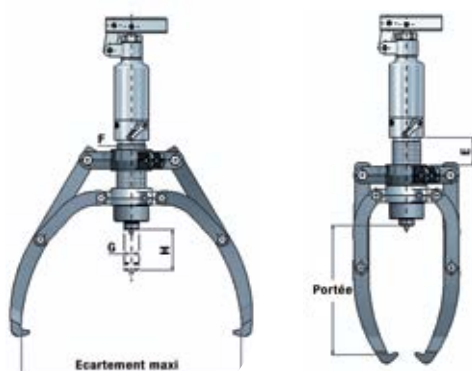
| Reference    | TOOL SCMP 2/3-(Max. reach) / Self-Center Mech Puller |                    |              |              |                 |           |           |                |
|--------------|------------------------------------------------------|--------------------|--------------|--------------|-----------------|-----------|-----------|----------------|
| Type         | Capacity<br>(tons)                                   | Max. reach<br>(mm) | Spread       |              | Jaws dimensions |           |           | Weight<br>(kg) |
|              |                                                      |                    | Min.<br>(mm) | Max.<br>(mm) | A<br>(mm)       | B<br>(mm) | C<br>(mm) |                |
| SCMP 2/3-120 | 2                                                    | 80                 | 36           | 120          | 8               | 6         | 15        | 1.6            |
| SCMP 2/3-180 | 3                                                    | 120                | 38           | 180          | 6               | 7         | 15        | 2.3            |
| SCMP 2/3-270 | 5                                                    | 160                | 42           | 270          | 11              | 10        | 25        | 4.3            |



# SELF-CENTERING HYDRAULIC PULLER (combined with 2 or 3 arms)

➤ P 21

| Reference    | TOOL SCHP (Capacity) TONS / Self-Center Hyd Puller |                             |                        |             |      |                 |      |    |    |    |    |             |
|--------------|----------------------------------------------------|-----------------------------|------------------------|-------------|------|-----------------|------|----|----|----|----|-------------|
| Type         | Capacity (ton)                                     | Max. gripping distance (mm) | Cylinder stroke H (mm) | Spread (mm) |      | Dimensions (mm) |      |    |    |    |    | Weight (kg) |
|              |                                                    |                             |                        | Min.        | Max. | A               | B    | C  | E  | F  | G  |             |
| SCHP 4 Tons  | 4                                                  | 190                         | 60                     | 68          | 325  | 13              | 10   | 22 | 40 | 42 | 22 | 9           |
| SCHP 12 Tons | 12                                                 | 305                         | 85                     | 90          | 485  | 15              | 16.5 | 29 | 70 | 60 | 28 | 17          |
| SCHP 20 Tons | 20                                                 | 365                         | 111                    | 120         | 570  | 20              | 27   | 33 | 62 | 80 | 40 | 28          |
| SCHP 30 Tons | 30                                                 | 465                         | 111                    | 120         | 680  | 20              | 27   | 38 | 85 | 98 | 50 | 39          |



## ACCESSORY CASE FOR HYDRAULIC PULLER

> P 22

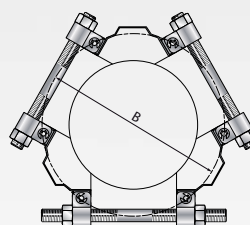
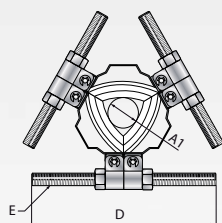
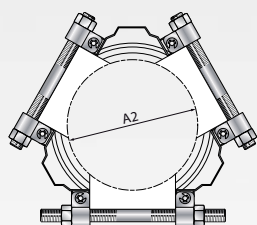
|              |                                                                      |                          |                               |
|--------------|----------------------------------------------------------------------|--------------------------|-------------------------------|
| Reference    | TOOL AS-SCHP (Hydraulic extractor capacity) T / acc set hyd puller   |                          |                               |
| Contents     | 1 pulling arm, 2 braces, 1 separator, 2 blades with 2 threaded studs |                          |                               |
| Reference    | Length of braces (mm)                                                | spread<br>Min./Max. (mm) | Weight with packaging<br>(kg) |
| AS-SCHP 4 T  | 250                                                                  | 25 - 110                 | 7                             |
| AS-SCHP 12 T | 325                                                                  | 80 - 225                 | 22                            |



## TRI-SECTION PULLING PLATE

> P 23

| Reference                                       |     | TOOL BP3S 50-210 / TRI-SECTION PULLING PLATE |                      |                  |               |                     |                |
|-------------------------------------------------|-----|----------------------------------------------|----------------------|------------------|---------------|---------------------|----------------|
| Materials                                       |     | Forged steel alloy                           |                      |                  |               |                     |                |
| DIMENSIONS<br>(mm)                              |     |                                              |                      |                  |               |                     |                |
| Shaft diameter<br>Min. (A1) / Max. (A2)<br>(mm) |     | Capacity<br>(ton)                            | Max spread B<br>(mm) | Length D<br>(mm) | Thread E      | Thickness F<br>(mm) | Weight<br>(kg) |
| 26                                              | 160 | 4                                            | 216                  | 240              | 5/8” – 11 UNC | 8                   | 3.5            |
| 50                                              | 210 | 8                                            | 280                  | 285              | 3/4” – 16 UNF | 31                  | 5.5            |
| 90                                              | 340 | 12                                           | 460                  | 430              | 7/8” – 16 UNF | 45                  | 16.5           |
| 140                                             | 495 | 30                                           | 660                  | 600              | 1” – 14 UNF   | 61                  | 41             |



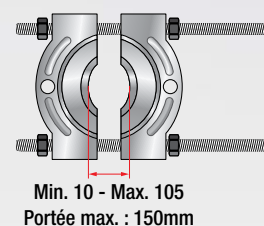
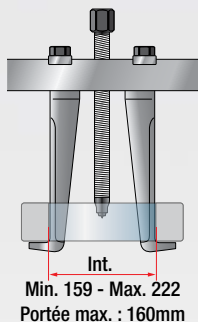
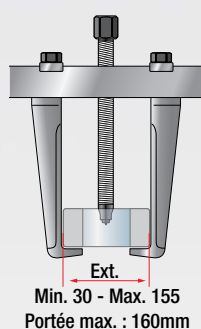
## PULLER - STRIPPING KIT

► P 24

|                 |                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------|
| Reference       | TOOL BPES 10-105                                                                                            |
| Contents        | 1 adjustable bridge, 1 separator, 2 removable puller arms<br>2 extensions, 1 tip protector, 2 coupling nuts |
| Case dimensions | 490 x 500 x 130 mm                                                                                          |
| Case weight     | 11 kg                                                                                                       |
| Capacity        | 100 kN (10 tons)                                                                                            |

### ► Description of components of the BPES case 10-105

|                          | Shaft diameter<br>(mm) | Bore diameter<br>(mm) | Outside diameter<br>(mm) | Max. reach<br>(mm) |
|--------------------------|------------------------|-----------------------|--------------------------|--------------------|
| Separator                | 10-105                 | -                     | 175 (max.)               | 150                |
| Internal gripping puller | -                      | 159-222               | -                        | 160                |
| External gripping puller | -                      | -                     | 30-155                   | 160                |

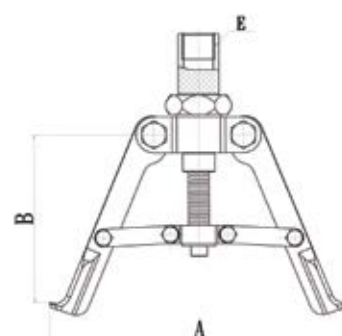
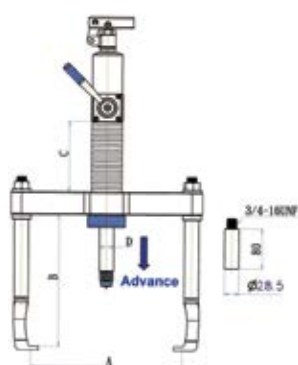
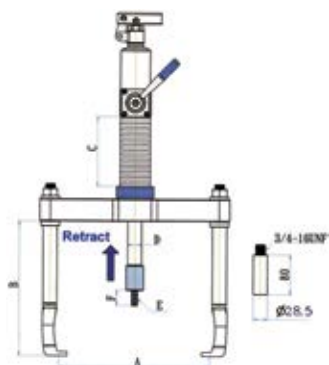


## HYDRAULIC PULLER FOR MOUNTING AND REMOVAL

► P 25

| Reference             |                | TOOL PUSH/PULLER 8/12 Tons                                                           |            |      |                 |     |    |           |    |             |
|-----------------------|----------------|--------------------------------------------------------------------------------------|------------|------|-----------------|-----|----|-----------|----|-------------|
| Contents              |                | 1 double acting hydraulic cylinder, 3 arms, 3 extensions, 1 internal gripping puller |            |      |                 |     |    |           |    |             |
| Type                  | Capacity (ton) | Reach (max.)                                                                         | Spread - A |      | Dimensions (mm) |     |    |           |    | Weight (kg) |
|                       |                |                                                                                      | Min.       | Max. | B               | C   | D  | E         | F  |             |
| Thrust                | 8              | 130                                                                                  | 44         | 280  | 270             | 140 | 28 | M12-P1.75 | 30 | 19.5        |
| Extraction (external) | 12             | 240*                                                                                 | 85         | 300  | 260             | 140 | 28 | -         | -  |             |
| Extraction (internal) | 8              | 105                                                                                  | 110        | 210  | 130-150         | -   | -  | 1"-12UNF  | -  |             |

\* without adapter (180 mm with adapter)

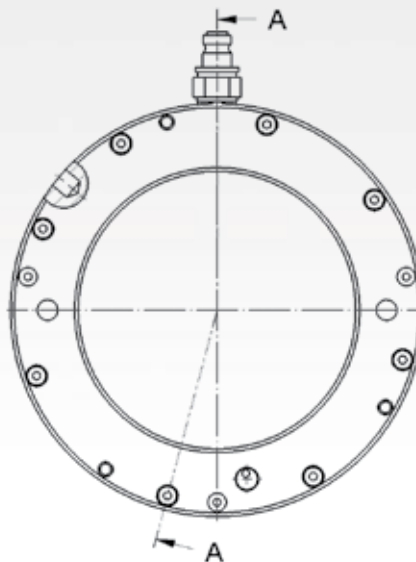
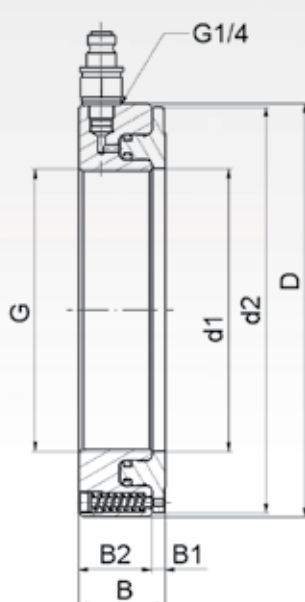


### HYDRAULIC NUTS (equipped with automatic piston return device)

> P 28

|                                                                          |                                                                                                         |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| References                                                               | TOOL HMV (size) EBF / Hydraulic Nut (metric)<br>TOOL HMVC (size) EBF / Hydraulic Nut (inches)           |
| Materials                                                                |                                                                                                         |
| HMV 10 EBF – HMV 40 EBF                                                  | Fine metric thread according to ISO 965-1998<br>Class 6H tolerance                                      |
| HMV 41 EBF – HMV 200 EBF                                                 | Trapezoidal thread according to ISO 2901-1993<br>Class 7H tolerance                                     |
| Nuts<br>Sizes ≤ HMV 54 EBF<br>Sizes ≤ HMV 100 EBF<br>Sizes ≤ HMV 200 EBF | Recommended pump references:<br>Pump 700b-0.3 l / Pump 700b-0.9 l<br>Pump 700b-0.9 l<br>Pump 1500b-2,5L |
| Component Reference - hydraulic nuts                                     |                                                                                                         |
| Set of O-rings                                                           | Nut Reference followed by / Piston Seals:<br>Example: TOOL HMV 15 / Piston Seals                        |
| Ball valve                                                               | 1500 bar<br>Reference: TOOL HMV BALL PLUG 1/4                                                           |
| Quick coupling connection (male)                                         | with seal washer and connecting nipple<br>Reference : TOOL HMV NIPPLE 1/4<br>Dimensions: see page 50    |

A-A ( 1 : 2 )



# DIMENSIONS (MM) AND WEIGHT (KG) OF HYDRAULIC NUTS (metric)

| Size        | Thread  | Outside diameter (mm) | Total width (mm) | Piston diameter (mm) | Permissible stroke of the piston (mm) | Flange width (mm) | Body width (mm) | Diameter (mm) | Surface of the piston (mm²) | Weight (kg) |
|-------------|---------|-----------------------|------------------|----------------------|---------------------------------------|-------------------|-----------------|---------------|-----------------------------|-------------|
| HMV ... EBF | G       | D                     | B                | max. d2              |                                       | B1                | B2              | d1            |                             |             |
| 10          | M50x1,5 | 114                   | 43               | 110                  | 5                                     | 5                 | 38              | 50.5          | 2850                        | 2.9         |
| 11          | M55x2   | 120                   | 43               | 116                  | 5                                     | 5                 | 38              | 55.5          | 3050                        | 3           |
| 12          | M60x2   | 125                   | 43               | 121                  | 5                                     | 5                 | 38              | 60.5          | 3250                        | 3           |
| 13          | M65x2   | 130                   | 43               | 126                  | 5                                     | 5                 | 38              | 65.5          | 3500                        | 3.2         |
| 14          | M70x2   | 135                   | 43               | 131                  | 5                                     | 5                 | 38              | 70.5          | 3650                        | 3.4         |
| 15          | M75x2   | 140                   | 43               | 136                  | 5                                     | 5                 | 38              | 75.5          | 3850                        | 3.6         |
| 16          | M80x2   | 146                   | 43               | 142                  | 5                                     | 5                 | 38              | 80.5          | 4150                        | 3.9         |
| 17          | M85x2   | 150                   | 43               | 146                  | 5                                     | 5                 | 38              | 85.5          | 4300                        | 4           |
| 18          | M90x2   | 156                   | 43               | 152                  | 5                                     | 5                 | 38              | 90.5          | 4850                        | 4.2         |
| 19          | M95x2   | 162                   | 43               | 158                  | 5                                     | 5                 | 38              | 95.5          | 5050                        | 4.5         |
| 20          | M100x2  | 166                   | 44               | 162                  | 5                                     | 6                 | 38              | 100.5         | 5100                        | 4.6         |
| 21          | M105x2  | 172                   | 44               | 168                  | 5                                     | 6                 | 38              | 105.5         | 5200                        | 4.9         |
| 22          | M110x2  | 178                   | 44               | 174                  | 5                                     | 6                 | 38              | 110.5         | 5400                        | 5.2         |
| 23          | M115x2  | 182                   | 44               | 178                  | 5                                     | 6                 | 38              | 115.5         | 5800                        | 5.2         |
| 24          | M120x2  | 188                   | 44               | 184                  | 5                                     | 6                 | 38              | 120.5         | 5950                        | 5.5         |
| 25          | M125x2  | 192                   | 44               | 188                  | 5                                     | 6                 | 38              | 125.5         | 6350                        | 5.6         |
| 26          | M130x2  | 198                   | 44               | 194                  | 5                                     | 6                 | 38              | 130.5         | 6450                        | 5.9         |
| 27          | M135x2  | 204                   | 44               | 200                  | 5                                     | 6                 | 38              | 135.5         | 6900                        | 6.1         |
| 28          | M140x2  | 208                   | 45               | 204                  | 5                                     | 7                 | 38              | 140.5         | 7250                        | 6.2         |
| 29          | M145x2  | 214                   | 46               | 210                  | 5                                     | 7                 | 39              | 145.5         | 7400                        | 6.7         |
| 30          | M150x2  | 220                   | 46               | 216                  | 5                                     | 7                 | 39              | 150.5         | 7600                        | 6.8         |
| 31          | M155x3  | 226                   | 46               | 222                  | 5                                     | 7                 | 39              | 155.5         | 8450                        | 7.2         |
| 32          | M160x3  | 232                   | 47               | 228                  | 6                                     | 7                 | 40              | 160.5         | 8650                        | 7.8         |
| 33          | M165x3  | 238                   | 47               | 234                  | 6                                     | 7                 | 40              | 165.5         | 8750                        | 8.1         |
| 34          | M170x3  | 244                   | 48               | 240                  | 6                                     | 7                 | 41              | 170.5         | 9800                        | 8.6         |
| 36          | M180x3  | 256                   | 48               | 252                  | 6                                     | 7                 | 41              | 180.5         | 11250                       | 9.4         |
| 38          | M190x3  | 270                   | 50               | 266                  | 7                                     | 8                 | 42              | 191           | 11800                       | 10.7        |
| 40          | M200x3  | 282                   | 51               | 278                  | 8                                     | 8                 | 43              | 201           | 12100                       | 11.7        |
| 41          | Tr205x4 | 288                   | 51               | 284                  | 8                                     | 8                 | 43              | 207           | 13050                       | 12.2        |
| 42          | Tr210x4 | 294                   | 52               | 290                  | 9                                     | 8                 | 44              | 212           | 13400                       | 12.7        |
| 43          | Tr215x4 | 300                   | 52               | 296                  | 9                                     | 8                 | 44              | 217           | 14050                       | 13.2        |
| 44          | Tr220x4 | 306                   | 52               | 302                  | 9                                     | 8                 | 44              | 222           | 14800                       | 13.7        |
| 45          | Tr225x4 | 312                   | 53               | 308                  | 9                                     | 8                 | 45              | 227           | 15150                       | 14.7        |
| 46          | Tr230x4 | 318                   | 53               | 314                  | 9                                     | 8                 | 45              | 232           | 15450                       | 14.7        |
| 47          | Tr235x4 | 326                   | 54               | 322                  | 10                                    | 8                 | 46              | 237           | 16600                       | 16.2        |
| 48          | Tr240x4 | 330                   | 55               | 326                  | 10                                    | 9                 | 46              | 242           | 17250                       | 16.2        |
| 50          | Tr250x4 | 342                   | 55               | 338                  | 10                                    | 9                 | 46              | 252           | 17550                       | 17.7        |
| 52          | Tr260x4 | 356                   | 56               | 352                  | 11                                    | 9                 | 47              | 262           | 19150                       | 19.2        |
| 54          | Tr270x4 | 368                   | 57               | 364                  | 12                                    | 9                 | 48              | 272           | 20350                       | 20.7        |
| 56          | Tr280x4 | 380                   | 58               | 376                  | 12                                    | 9                 | 49              | 282           | 21050                       | 22.2        |
| 58          | Tr290x4 | 390                   | 58               | 386                  | 13                                    | 9                 | 49              | 292           | 22350                       | 22.7        |
| 60          | Tr300x4 | 404                   | 61               | 400                  | 14                                    | 10                | 51              | 302           | 23600                       | 25.7        |

**DIMENSIONS (MM) AND WEIGHT (KG) OF HYDRAULIC NUTS (metric)**

| Size        | Thread   | Outside diameter (mm) | Total width (mm) | Piston diameter (mm) | Permissible stroke of the piston (mm) | Flange width (mm) | Body width (mm) | Diameter (mm) | Surface of the piston (mm <sup>2</sup> ) | Weight (kg) |
|-------------|----------|-----------------------|------------------|----------------------|---------------------------------------|-------------------|-----------------|---------------|------------------------------------------|-------------|
| HMV ... EBF | G        | D                     | B                | max. d2              |                                       | B1                | B2              | d1            |                                          |             |
| 62          | Tr310x5  | 416                   | 62               | 412                  | 14                                    | 10                | 52              | 312           | 24850                                    | 27.2        |
| 64          | Tr320x5  | 428                   | 63               | 424                  | 14                                    | 10                | 53              | 322           | 26250                                    | 29.7        |
| 66          | Tr330x5  | 438                   | 63               | 434                  | 14                                    | 10                | 53              | 332           | 27500                                    | 30.2        |
| 68          | Tr340x5  | 450                   | 64               | 446                  | 14                                    | 10                | 54              | 342           | 27750                                    | 31.7        |
| 69          | Tr345x5  | 456                   | 64               | 452                  | 14                                    | 10                | 54              | 347           | 29350                                    | 32.7        |
| 70          | Tr350x5  | 464                   | 66               | 460                  | 14                                    | 10                | 56              | 352           | 29800                                    | 35.2        |
| 72          | Tr360x5  | 472                   | 66               | 468                  | 15                                    | 10                | 56              | 362           | 31250                                    | 35.7        |
| 73          | Tr365x5  | 482                   | 68               | 478                  | 15                                    | 11                | 57              | 367           | 31600                                    | 38.7        |
| 74          | Tr370x5  | 486                   | 68               | 482                  | 16                                    | 11                | 57              | 372           | 33300                                    | 39.2        |
| 76          | Tr380x5  | 498                   | 69               | 494                  | 16                                    | 11                | 58              | 382           | 33500                                    | 40.7        |
| 77          | Tr385x5  | 504                   | 69               | 500                  | 16                                    | 11                | 58              | 387           | 34050                                    | 41.2        |
| 80          | Tr400x5  | 522                   | 71               | 518                  | 17                                    | 11                | 60              | 402           | 36600                                    | 45.7        |
| 82          | Tr410x5  | 534                   | 72               | 530                  | 17                                    | 11                | 61              | 412           | 38200                                    | 48.2        |
| 84          | Tr420x5  | 546                   | 72               | 542                  | 17                                    | 11                | 61              | 422           | 39900                                    | 50.2        |
| 86          | Tr430x5  | 556                   | 73               | 552                  | 17                                    | 11                | 62              | 432           | 40750                                    | 52.7        |
| 88          | Tr440x5  | 566                   | 74               | 562                  | 17                                    | 12                | 62              | 442           | 42400                                    | 54.2        |
| 90          | Tr450x5  | 580                   | 76               | 576                  | 17                                    | 12                | 64              | 452           | 44100                                    | 57.7        |
| 92          | Tr460x5  | 590                   | 76               | 586                  | 17                                    | 12                | 64              | 462           | 45100                                    | 60.2        |
| 94          | Tr470x5  | 602                   | 77               | 598                  | 18                                    | 12                | 65              | 472           | 46800                                    | 62.2        |
| 96          | Tr480x5  | 612                   | 77               | 608                  | 19                                    | 12                | 65              | 482           | 48600                                    | 63.2        |
| 98          | Tr490x5  | 624                   | 78               | 620                  | 19                                    | 12                | 66              | 492           | 49500                                    | 66.2        |
| 100         | Tr500x5  | 636                   | 79               | 630                  | 19                                    | 12                | 67              | 502           | 49950                                    | 70.2        |
| 102         | Tr510x6  | 648                   | 80               | 642                  | 20                                    | 12                | 68              | 512           | 53300                                    | 74.2        |
| 104         | Tr520x6  | 658                   | 81               | 652                  | 20                                    | 13                | 68              | 522           | 54250                                    | 75.2        |
| 106         | Tr530x6  | 670                   | 82               | 664                  | 21                                    | 13                | 69              | 532           | 56150                                    | 79.2        |
| 108         | Tr540x6  | 682                   | 82               | 676                  | 21                                    | 13                | 69              | 542           | 58200                                    | 81.2        |
| 110         | Tr550x6  | 693                   | 83               | 687                  | 21                                    | 13                | 70              | 552           | 59150                                    | 84.2        |
| 112         | Tr560x6  | 704                   | 84               | 698                  | 22                                    | 13                | 71              | 562           | 61150                                    | 88.2        |
| 114         | Tr570x6  | 716                   | 85               | 710                  | 23                                    | 13                | 72              | 572           | 63200                                    | 91.2        |
| 116         | Tr580x6  | 726                   | 85               | 720                  | 23                                    | 13                | 72              | 582           | 64200                                    | 94.2        |
| 120         | Tr600x6  | 748                   | 86               | 742                  | 23                                    | 13                | 73              | 602           | 67400                                    | 100.2       |
| 126         | Tr630x6  | 782                   | 88               | 776                  | 23                                    | 14                | 74              | 632           | 72850                                    | 110.2       |
| 130         | Tr650x6  | 804                   | 89               | 798                  | 23                                    | 14                | 75              | 652           | 76100                                    | 115.2       |
| 134         | Tr670x6  | 826                   | 90               | 820                  | 24                                    | 14                | 76              | 672           | 79450                                    | 120.2       |
| 138         | Tr690x6  | 848                   | 91               | 842                  | 25                                    | 14                | 77              | 692           | 84200                                    | 127.2       |
| 142         | Tr710x7  | 870                   | 93               | 864                  | 25                                    | 15                | 78              | 712           | 87700                                    | 135.2       |
| 150         | Tr750x7  | 912                   | 94               | 906                  | 25                                    | 15                | 79              | 752           | 95050                                    | 146.2       |
| 160         | Tr800x7  | 965                   | 96               | 959                  | 25                                    | 16                | 80              | 802           | 103800                                   | 161.2       |
| 170         | Tr850x7  | 1020                  | 99               | 1014                 | 26                                    | 16                | 83              | 852           | 114450                                   | 181.2       |
| 180         | Tr900x7  | 1075                  | 103              | 1069                 | 30                                    | 17                | 86              | 902           | 123950                                   | 205.2       |
| 190         | Tr950x8  | 1126                  | 103              | 1120                 | 30                                    | 17                | 86              | 952           | 135450                                   | 218.2       |
| 200         | Tr1000x8 | 1180                  | 105              | 1174                 | 34                                    | 17                | 88              | 1002          | 145700                                   | 239.2       |

**DIMENSION (MM) AND WEIGHT (KG) OF HYDRAULIC NUTS(dimension in inches)**

| Size         | Thread | Number of threads per inch | Outside diameter (in.) | Total width (in.) | Piston diameter (in.) | Permissible stroke of the piston (in.) | Flange width (in.) | Body width (in.) | Diameter (in.) | Surface of the piston (in. <sup>2</sup> ) | Weight (lb) |
|--------------|--------|----------------------------|------------------------|-------------------|-----------------------|----------------------------------------|--------------------|------------------|----------------|-------------------------------------------|-------------|
| HMVC ... EBF | G      |                            | D                      | B                 | max. d2               |                                        | B1                 | B2               | d1             |                                           |             |
| 10           | 1.967  | 18                         | 4.5                    | 1.7               | 4.4                   | 0.20                                   | 0.20               | 1.5              | 2.0            | 4.4                                       | 6.3         |
| 11           | 2.157  | 18                         | 4.7                    | 1.7               | 4.6                   | 0.20                                   | 0.20               | 1.5              | 2.2            | 4.8                                       | 6.8         |
| 12           | 2.360  | 18                         | 4.9                    | 1.7               | 4.8                   | 0.20                                   | 0.20               | 1.5              | 2.4            | 5.1                                       | 7.2         |
| 13           | 2.548  | 18                         | 5.1                    | 1.7               | 5.0                   | 0.20                                   | 0.20               | 1.5              | 2.6            | 5.4                                       | 7.6         |
| 14           | 2.751  | 18                         | 5.3                    | 1.7               | 5.2                   | 0.20                                   | 0.20               | 1.5              | 2.8            | 5.8                                       | 7.9         |
| 15           | 2.933  | 12                         | 5.5                    | 1.7               | 5.4                   | 0.20                                   | 0.20               | 1.5              | 3.0            | 6.1                                       | 8.3         |
| 16           | 3.137  | 12                         | 5.7                    | 1.7               | 5.6                   | 0.20                                   | 0.20               | 1.5              | 3.2            | 6.4                                       | 8.7         |
| 17           | 3.340  | 12                         | 5.9                    | 1.7               | 5.8                   | 0.20                                   | 0.20               | 1.5              | 3.4            | 6.7                                       | 9.1         |
| 18           | 3.527  | 12                         | 6.1                    | 1.7               | 6.0                   | 0.20                                   | 0.20               | 1.5              | 3.6            | 6.8                                       | 9.5         |
| 19           | 3.730  | 12                         | 6.4                    | 1.7               | 6.2                   | 0.20                                   | 0.20               | 1.5              | 3.8            | 7.5                                       | 10.0        |
| 20           | 3.918  | 12                         | 6.5                    | 1.7               | 6.4                   | 0.20                                   | 0.24               | 1.5              | 4.0            | 7.5                                       | 10.4        |
| 21           | 4.122  | 12                         | 6.8                    | 1.7               | 6.6                   | 0.20                                   | 0.24               | 1.5              | 4.2            | 8.1                                       | 11.0        |
| 22           | 4.325  | 12                         | 7.0                    | 1.7               | 6.9                   | 0.20                                   | 0.24               | 1.5              | 4.4            | 8.8                                       | 11.6        |
| 24           | 4.716  | 12                         | 7.4                    | 1.7               | 7.2                   | 0.20                                   | 0.24               | 1.5              | 4.8            | 9.4                                       | 12.4        |
| 26           | 5.106  | 12                         | 7.8                    | 1.7               | 7.6                   | 0.20                                   | 0.24               | 1.5              | 5.2            | 10.1                                      | 13.2        |
| 28           | 5.497  | 12                         | 8.2                    | 1.8               | 8.0                   | 0.20                                   | 0.28               | 1.5              | 5.6            | 10.7                                      | 14.3        |
| 30           | 5.888  | 12                         | 8.7                    | 1.8               | 8.5                   | 0.20                                   | 0.28               | 1.5              | 6.0            | 12.3                                      | 16.0        |
| 32           | 6.284  | 8                          | 9.1                    | 1.9               | 9.0                   | 0.24                                   | 0.28               | 1.6              | 6.4            | 14.0                                      | 18.0        |
| 34           | 6.659  | 8                          | 9.6                    | 1.9               | 9.4                   | 0.24                                   | 0.28               | 1.6              | 6.8            | 15.8                                      | 19.9        |
| 36           | 7.066  | 8                          | 10.1                   | 1.9               | 9.9                   | 0.24                                   | 0.28               | 1.6              | 7.2            | 17.7                                      | 21.5        |
| 38           | 7.472  | 8                          | 10.6                   | 2.0               | 10.5                  | 0.28                                   | 0.31               | 1.7              | 7.6            | 18.5                                      | 24.9        |
| 40           | 7.847  | 8                          | 11.1                   | 2.0               | 10.9                  | 0.31                                   | 0.31               | 1.7              | 8.0            | 19.4                                      | 27.3        |
| 44           | 8.628  | 8                          | 12.0                   | 2.0               | 11.9                  | 0.31                                   | 0.31               | 1.7              | 8.8            | 21.1                                      | 31.9        |
| 46           | 9.125  | 8                          | 12.5                   | 2.1               | 12.4                  | 0.31                                   | 0.31               | 1.8              | 9.2            | 21.9                                      | 34.7        |
| 48           | 9.442  | 6                          | 13.0                   | 2.2               | 12.8                  | 0.35                                   | 0.35               | 1.8              | 9.6            | 25.4                                      | 37.8        |
| 52           | 10.192 | 6                          | 14.0                   | 2.2               | 13.9                  | 0.35                                   | 0.35               | 1.9              | 10.4           | 27.2                                      | 44.4        |
| 56           | 11.004 | 6                          | 15.0                   | 2.3               | 14.8                  | 0.39                                   | 0.35               | 1.9              | 11.2           | 30.7                                      | 51.4        |
| 60           | 11.785 | 6                          | 16.1                   | 2.4               | 16.0                  | 0.39                                   | 0.39               | 2.0              | 12.0           | 37.0                                      | 64.4        |
| 64           | 12.562 | 6                          | 16.9                   | 2.5               | 16.8                  | 0.43                                   | 0.39               | 2.1              | 12.8           | 39.2                                      | 70.8        |
| 68           | 13.339 | 5                          | 17.7                   | 2.5               | 17.6                  | 0.47                                   | 0.39               | 2.1              | 13.5           | 41.4                                      | 75.7        |
| 72           | 14.170 | 5                          | 18.9                   | 2.6               | 18.7                  | 0.51                                   | 0.39               | 2.2              | 14.3           | 51.8                                      | 89.7        |
| 76           | 14.957 | 5                          | 19.7                   | 2.7               | 19.5                  | 0.55                                   | 0.43               | 2.3              | 15.1           | 54.4                                      | 98.2        |
| 80           | 15.745 | 5                          | 20.9                   | 2.8               | 20.7                  | 0.55                                   | 0.43               | 2.4              | 15.9           | 54.8                                      | 116.4       |
| 84           | 16.532 | 5                          | 21.9                   | 2.8               | 21.7                  | 0.55                                   | 0.43               | 2.4              | 16.7           | 60.8                                      | 127.7       |
| 88           | 17.319 | 5                          | 22.6                   | 2.9               | 22.5                  | 0.55                                   | 0.43               | 2.4              | 17.5           | 63.4                                      | 134.1       |
| 92           | 18.107 | 5                          | 23.6                   | 3.0               | 23.5                  | 0.59                                   | 0.47               | 2.5              | 18.3           | 71.3                                      | 150.6       |
| 96           | 18.894 | 5                          | 24.4                   | 3.0               | 24.3                  | 0.63                                   | 0.47               | 2.6              | 19.1           | 78.2                                      | 158.0       |
| 100          | 19.682 | 5                          | 25.6                   | 3.1               | 25.4                  | 0.63                                   | 0.47               | 2.6              | 19.8           | 85.7                                      | 181.6       |
| 106          | 20.867 | 4                          | 26.8                   | 3.2               | 26.6                  | 0.67                                   | 0.51               | 2.7              | 21.0           | 85.89                                     | 199.4       |
| 112          | 22.048 | 4                          | 28.1                   | 3.3               | 28.0                  | 0.71                                   | 0.51               | 2.8              | 22.2           | 87.0                                      | 221.1       |
| 120          | 23.623 | 4                          | 29.9                   | 3.4               | 29.8                  | 0.75                                   | 0.51               | 2.9              | 23.8           | 101.0                                     | 249.2       |
| 126          | 24.804 | 4                          | 31.1                   | 3.5               | 30.9                  | 0.75                                   | 0.55               | 2.9              | 25.0           | 105.6                                     | 266.4       |
| 134          | 26.379 | 4                          | 33.1                   | 3.5               | 32.9                  | 0.87                                   | 0.55               | 3.0              | 26.5           | 125.3                                     | 307.8       |
| 142          | 27.961 | 3                          | 34.6                   | 3.7               | 34.5                  | 0.91                                   | 0.59               | 3.1              | 28.1           | 132.1                                     | 337.1       |
| 150          | 29.536 | 3                          | 36.2                   | 3.7               | 36.1                  | 0.91                                   | 0.59               | 3.1              | 29.7           | 138.9                                     | 358.1       |
| 160          | 31.504 | 3                          | 38.2                   | 3.8               | 38.0                  | 0.98                                   | 0.63               | 3.1              | 31.7           | 147.4                                     | 387.1       |
| 170          | 33.473 | 3                          | 40.6                   | 3.9               | 40.4                  | 1.02                                   | 0.63               | 3.3              | 33.6           | 179.2                                     | 448.0       |
| 180          | 35.441 | 3                          | 43.3                   | 4.1               | 43.1                  | 1.10                                   | 0.67               | 3.4              | 35.6           | 238.6                                     | 545.6       |
| 190          | 37.410 | 3                          | 45.3                   | 4.1               | 45.1                  | 1.10                                   | 0.67               | 3.4              | 37.6           | 250.8                                     | 575.3       |

## MANUAL HYDRAULIC PUMP KITS

► P 29

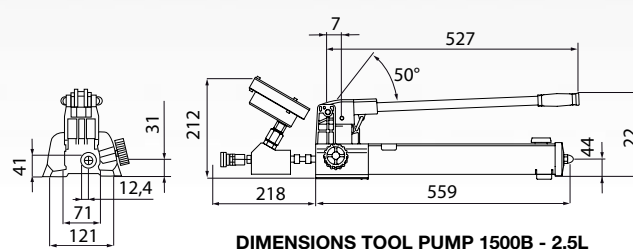
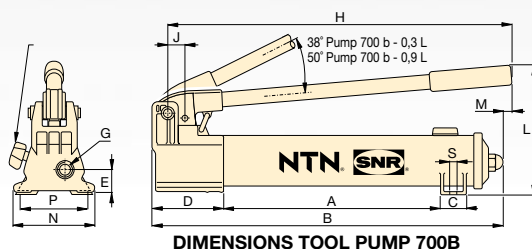
| References                             | TOOL PUMP SET 700B-(Reservoir capacity) L / Pump with accessories<br>TOOL PUMP SET 1500B 2,5 L / Pump with accessories |                                       |                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------|
| Contents                               | Pump Set 700b-0,3L                                                                                                     | Pump Set 700b-0,9L                    | Pump Set 1500b - 2,5 L                 |
| Ⓐ 1 2-stage manual pump                | 700 bar pump with 0.3 litre reservoir                                                                                  | 700 bar pump with 0.9 litre reservoir | 1500 bar pump with 2,5 litre reservoir |
| Ⓑ 1 adaptor for pressure gauge*        | 1/4" male, 3/8" female                                                                                                 | 3/8" male, 3/8" female                | 1500 bar pressure gauge block          |
| Ⓒ 1 pressure gauge                     | 700 bar                                                                                                                | 700 bar                               |                                        |
| Ⓓ 1 hose                               | 700 bar, length 1,5 m                                                                                                  | 700 bar, length 3 m                   | 1500 bar, length 3m                    |
| Ⓔ 1 quick coupling connection (female) | G 1/4 (1500 bar)                                                                                                       | G 1/4 (1500 bar)                      | G 1/4 (1500 bar)                       |

► Description of the manual hydraulic pump kit components

## Ⓐ ULTRA LIGHT MANUAL PUMP (with two stages)

► P 29

| Reference           |                                                    |     |                                                    |    |                                                 |                | TOOL PUMP 700b - (reservoir capacity) l<br>TOOL PUMP 1500B 2.5 l |     |                        |     |                               |     |    |   |
|---------------------|----------------------------------------------------|-----|----------------------------------------------------|----|-------------------------------------------------|----------------|------------------------------------------------------------------|-----|------------------------|-----|-------------------------------|-----|----|---|
| Material            |                                                    |     |                                                    |    |                                                 |                | Glass fibre reinforced composite tank                            |     |                        |     |                               |     |    |   |
| Reference<br>TOOL + | Nominal pressure<br>1 <sup>st</sup> stage<br>(bar) |     | Nominal pressure<br>2 <sup>nd</sup> stage<br>(bar) |    | Volume/stroke<br>1 <sup>st</sup> stage<br>(cm³) |                | Volume/stroke<br>2 <sup>nd</sup> stage<br>(cm³)                  |     | Tank capacity<br>(cm³) |     | Weight (bare<br>pump)<br>(kg) |     |    |   |
| PUMP<br>700b-0.3l   | 13                                                 |     | 700                                                |    | 3.6                                             |                | 0.9                                                              |     | 320                    |     | 2.4                           |     |    |   |
| PUMP<br>700b-0.9l   | 13                                                 |     | 700                                                |    | 11.3                                            |                | 2.5                                                              |     | 900                    |     | 4.1                           |     |    |   |
| PUMP<br>1500b-2.5l  | 13                                                 |     | 1500                                               |    | 11.3                                            |                | 2.5                                                              |     | 2540                   |     | 9                             |     |    |   |
| Reference<br>TOOL + | DIMENSIONS (mm)                                    |     |                                                    |    |                                                 |                |                                                                  |     |                        |     |                               |     |    |   |
|                     | A                                                  | B   | C                                                  | D  | E                                               | G              |                                                                  | H   | J                      | L   | M                             | N   | P  | S |
| PUMP<br>700b-0.3l   | 185                                                | 336 | 28                                                 | 85 | 28                                              | 1/4» - 18 NPTF |                                                                  | 319 | 19                     | 143 | -                             | 95  | 80 | 7 |
| PUMP<br>700b-0.9l   | 344                                                | 533 | 36                                                 | 99 | 33                                              | 3/8" - 18 NPTF |                                                                  | 522 | 30                     | 177 | 16                            | 120 | -  | - |

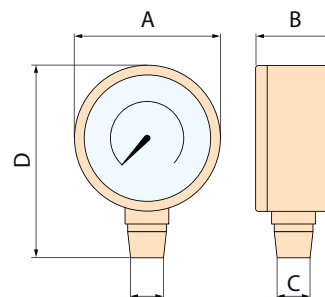


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| Reference           | TOOL gauge adapter (Reservoir capacity) I |           |              |
|---------------------|-------------------------------------------|-----------|--------------|
| Reference TOOL+     | Pressure gauge port                       | Male end  | Female end   |
| GAUGE ADAPTER 0.3 I | NPTF<br>1/4"                              | NPTF 1/4" | NPTF<br>3/8" |
| GAUGE ADAPTER 0.9 I |                                           | NPTF 3/8" |              |

## 

| Reference                | TOOL PUMP GAUGE 700  |
|--------------------------|----------------------|
| Permitted pressure       | 700 bar (10 000 psi) |
| Precision (% full scale) | +/- 1.0 (-1.5%)      |
| Graduation               | Bar                  |
| Scales                   | Bar                  |
| Large graduations        | 100                  |
| Small graduations        | 20                   |
| Connecting thread C      | 1/4" NPTF            |
| Diameter A               | 100 mm               |
| Height D                 | 130 mm               |
| Thickness B              | 35 mm                |



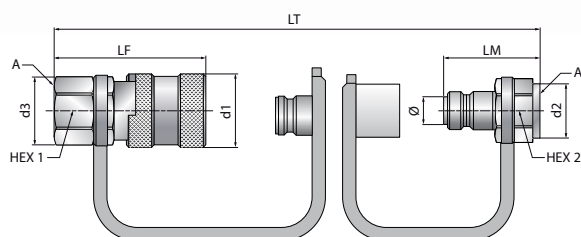
\* For the 1500 bar – 2.5L pump, B and C are supplied as a complete unit. For information on "pressure gauge kit" spare parts, please contact us.

## 

| Reference                      | TOOL HYDRAULIC HOSE (length in mm)                                                |                     |             |             |                  |                         |
|--------------------------------|-----------------------------------------------------------------------------------|---------------------|-------------|-------------|------------------|-------------------------|
| Material                       | Thermoplastic reinforced with layers of woven steel wire<br>Polyurethane envelope |                     |             |             |                  |                         |
| References                     | Max. working pressure (bar)                                                       | Inner diameter (mm) | Length (mm) | Weight (kg) | Connection end 1 | Connection end 2 (male) |
| TOOL HYDRAULIC HOSE 1500       | 700                                                                               | 6.4                 | 1,500       | 0.8         | 3/8" - 18 NPTF   | G 1/4 750 bar           |
| TOOL HYDRAULIC HOSE 3000       | 700                                                                               | 6.4                 | 3,000       | 1.5         | 3/8" - 18 NPTF   | G 1/4 750 bar           |
| TOOL 1500B HYDRAULIC HOSE 3000 | 1500                                                                              | 5                   | 3,000       | 1.5         | 1/4 BSPP         | G 1/4 1500 bar          |

## 

| Reference                | TOOL PUMP COUPLING 1/4                                    |
|--------------------------|-----------------------------------------------------------|
| Material                 | High strength steel. Black zinc treatment                 |
| Type of valve            | Flat face for minimum discharge of fluid on disconnection |
| Maximum service pressure | 1500 bar                                                  |



**Note** – Seal washer and connecting nipple included in HMV NIPPLE 1/4 are not represented on the drawing.

| Thread A BSPP | d1 (mm) | d3 (mm) | Nut Hex1 (mm) | LF (mm) | d2 (mm) | Nut Hex2 (mm) | LM (mm) | LT (mm) | Ø (mm) | Reference Female TOOL+ | Weight (g) | Reference Male TOOL+ | Weight (g) |
|---------------|---------|---------|---------------|---------|---------|---------------|---------|---------|--------|------------------------|------------|----------------------|------------|
| G 1/4         | 28.2    | 26.8    | 24            | 59.5    | 24.5    | 22            | 38      | 79.5    | 14.9   | PUMP COUPLING 1/4      | 192        | HMV NIPPLE 1/4       | 69         |

## HEAT-RESISTANT GLOVES

► P 32

| Reference           | TOOL GLOVE HEAT RESISTANT |
|---------------------|---------------------------|
| Material            | KEVLAR                    |
| Lined               | Coton                     |
| Single size         | 10.5                      |
| Maximum temperature | 350°C                     |
| Quantity per packet | 1                         |

## SET OF CALIBRATED FEELER GAUGES OF CALIBRATED THICKNESS ► P 32

| Reference              | FEELER GAUGE TOOL (gauge length) |                           |                               |      |             |            |     |     |
|------------------------|----------------------------------|---------------------------|-------------------------------|------|-------------|------------|-----|-----|
|                        | Number of gauges                 | Field of measurement (mm) | Blade thickness (1/100 of mm) |      | Length (mm) | Weight (g) |     |     |
| TOOL FEELER GAUGES 100 | 17                               | 0.02 – 0.5                | 0.02                          | 0.15 | 100         | 65         |     |     |
|                        |                                  |                           | 0.03                          | 0.20 |             |            |     |     |
|                        |                                  |                           | 0.04                          | 0.25 |             |            |     |     |
| TOOL FEELER GAUGES 150 |                                  |                           |                               |      | 0.05        | 0.30       | 150 | 85  |
|                        |                                  |                           | 0.06                          | 0.35 |             |            |     |     |
|                        |                                  |                           | 0.07                          | 0.40 |             |            |     |     |
| TOOL FEELER GAUGES 300 |                                  |                           |                               |      | 0.08        | 0.45       | 300 | 175 |
|                        |                                  |                           |                               |      | 0.09        | 0.50       |     |     |
|                        |                                  |                           |                               |      | 0.10        |            |     |     |

## INFRARED THERMOMETER WITH LASER

► P 33

### Reference

TOOL LASERTEMP 301 / IR Thermometer

### APPLIANCE CHARACTERISTICS

|                                                |                                                                                                                                                                                                                                                                               |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spectral response                              | 8 -14 mm                                                                                                                                                                                                                                                                      |
| Optics                                         | D.S : 30:1 (50 mm to 1500 mm)                                                                                                                                                                                                                                                 |
| Response time                                  | Less than one second                                                                                                                                                                                                                                                          |
| Temperature range                              | From -50 to +850°C                                                                                                                                                                                                                                                            |
| Accuracy*                                      | From -50 to -20°C : $\pm 5^{\circ}\text{C}$<br>From -20 to +200°C : $\pm 1.5\%$ of the reading $\pm 2^{\circ}\text{C}$<br>From +200 to +538 °C : $\pm 2\%$ of the reading $\pm 2^{\circ}\text{C}$<br>From +538 to +850°C : $\pm 3.5\%$ of the reading $\pm 5^{\circ}\text{C}$ |
| Display resolution                             | 0.1°C                                                                                                                                                                                                                                                                         |
| Emissivity                                     | Adjustable between 0.10 and 1.00<br>(pre-set at 0.95)                                                                                                                                                                                                                         |
| Screen indication :                            | Indication of level exceeded<br>“-01” for under-range<br>“01” for over-range                                                                                                                                                                                                  |
| Laser aiming device                            | Wave length : 630-670 nm<br>output lower than 1mW, class 2 (II)                                                                                                                                                                                                               |
| Indication of positive or negative temperature | Automatic (no indication for a positive temperature)<br>Sign (-) for a negative temperature                                                                                                                                                                                   |
| Screen                                         | 4½ digits with backlit LCD screen                                                                                                                                                                                                                                             |
| Auto switch-off:                               | After 7 seconds of inactivity<br>High/low alarm                                                                                                                                                                                                                               |
| Thresholds                                     | Flashing signal on screen and audible signal<br>with adjustable thresholds                                                                                                                                                                                                    |
| Supply                                         | 9 V alkaline battery                                                                                                                                                                                                                                                          |
| Battery life                                   | 38 hr (laser and backlight inactive)<br>15 hr (laser and backlight active)                                                                                                                                                                                                    |
| Temperature for use                            | From 0 to +50°C                                                                                                                                                                                                                                                               |
| Storage temperature                            | From -20°C to +60°C                                                                                                                                                                                                                                                           |
| Relative humidity                              | From 10% to 90% RH in operation and<br>less than 80% RH in storage                                                                                                                                                                                                            |
| Dimensions                                     | 175 x 110 x 45 mm                                                                                                                                                                                                                                                             |
| Weight                                         | 230 g (including battery)                                                                                                                                                                                                                                                     |
| Memory                                         | 20 temperature values with unit of measurement (°C or °F)                                                                                                                                                                                                                     |

\* Accurate for an ambient temperature between 18 and 28°C (with relative humidity below 80%)

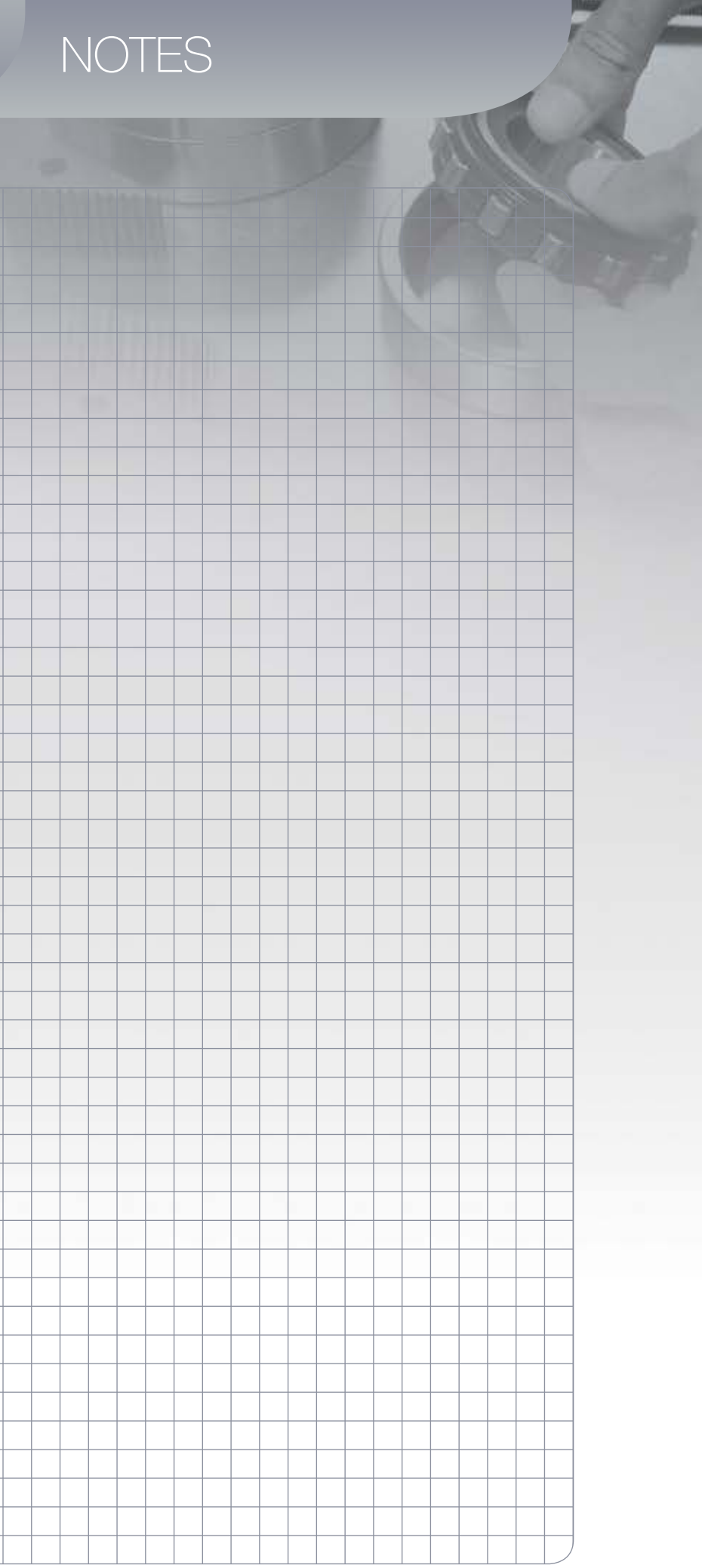
### CHARACTERISTICS OF THE THERMOCOUPLE PROBE K

|                   |                                                    |
|-------------------|----------------------------------------------------|
| Temperature range | From -40 to +400°C                                 |
| Display range     | From -50 to +1370°C                                |
| Resolution        | 0.1°C                                              |
| Accuracy          | $\pm 1.5\%$ of the reading $\pm 3^{\circ}\text{C}$ |
| Cable length      | 1 m                                                |



The devices meet the following standards 1992, electromagnetic emissions  
EN 50081-1: 1992, electromagnetic interference  
EN 50082-1: 1992, electromagnetic susceptibility

| References                                                      | Descriptions                                                      | Catalogue pages | Technical data pages |
|-----------------------------------------------------------------|-------------------------------------------------------------------|-----------------|----------------------|
| Cold mounting case                                              | TOOL IFT SET 33 / Industry Fitting Tool Set                       | P 09            | P 36                 |
| “Contact corrosion” anti-fretting paste                         | LUB ANTI-FRETTING PASTE (packaging)                               | P 11            | P 36                 |
| Articulated manual pin spanner                                  | TOOL PS (min. size – max. size) / Pin Spanner                     | P 11            | P 36                 |
| Articulated manual hook spanner                                 | TOOL HS (min. size –max. size) / Hook Spanner                     | P 11            | P 36                 |
| Induction heater                                                | TOOL FAST THERM (capacity) / Induction Heater                     | P 14-15         | P 38                 |
| Induction heater                                                | TOOL SAFE THERM (capacity) Induction Heater                       | P 15-16         | P 39                 |
| Only bar for induction heater                                   | TOOL FT (capacity) - YOKE (Min. Bore)                             | P 14-16         | P 40                 |
| Temperature probe for induction heater                          | TOOL TEMP PROBE (Size)                                            | P 14-16         | P 38-39              |
| Bar lifting device for heater                                   | TOOL FT (Capacity) LIFTING DEVICE                                 | P 16            | P 39                 |
| Bore puller kit with internal gripping                          | TOOL BP SET (min. size – max. size) / Bore Puller                 | P 18            | P 41                 |
| Deep-groove ball bearing puller kit                             | TOOL BBPS 10-100/ball bearing / Puller set                        | P 19            | P 42                 |
| Self-centering mechanical puller                                | TOOL SCMP 2/3 - (max. reach) / Self-Center Mech Puller            | P 20            | P 43                 |
| Self-centering hydraulic puller                                 | TOOL SCHP (capacity) TONS / Self-Center Hyd Puller                | P 21            | P 43                 |
| Accessories case for self-centering hydraulic puller            | TOOL AS-SCHP (Capacity) T / Acc. Set Hyd Puller                   | P 22            | P 44                 |
| Tri-section pulling plate                                       | TOOL BP3S 50-210 / TRI-SECTION PULLING PLATE                      | P 23            | P 44                 |
| Mechanical spindle puller-separator Kit                         | TOOL BPES 10-105 / Back Puller extract set                        | P 24            | P 45                 |
| Hydraulic puller for mounting and removal                       | TOOL PUSH/PULLER 8/12 Tons                                        | P 25            | P 45                 |
| ¼" gas ball valve                                               | TOOL HMV BALL PLUG 1/4                                            | P 28            | P 46                 |
| Set of O-rings for hydraulic nut                                | TOOL HMV (Size) / Piston Seals                                    | P 28            | P 46                 |
| Hydraulic nut with metric thread and piston return device       | Hydraulic Nut                                                     | P 28            | P 46-49              |
| Manual hydraulic pump kit                                       | TOOL PUMP SET 700B-(reservoir capacity) L / Pump with accessories | P 29            | P 50                 |
| Manual hydraulic pump kit                                       | TOOL PUMP SET 1500B - 2.5 l / Pump with accessories               | P 29            | P 50                 |
| Oil for pump 700b and 1500b                                     | TOOL HYDRAULIC OIL 1L                                             | P 29            | P 50                 |
| Pump pressure gauge, 700 bars                                   | TOOL PUMP GAUGE 700                                               | P 29            | P 51                 |
| Quick coupling connection, ¼ gas (female)                       | TOOL PUMP COUPLING 1/4                                            | P 29            | P 51                 |
| Pressure gauge adapter depending on pump                        | TOOL gauge ADAPTER (Reservoir capacity)                           | P 29            | P 51                 |
| High-pressure hose with quick coupling connector (female)       | TOOL HYDRAULIC HOSE (Length mm)<br>TOOL 1500b HYDRAULIC HOSE 3000 | P 29            | P 51                 |
| Quick coupling connection, ¼ gas (male)                         | TOOL HMV NIPPLE ¼                                                 | P 29            | P 51                 |
| Thermal insulation gloves                                       | TOOL GLOVE HEAT RESISTANT                                         | P 32            | P 52                 |
| Set of feeler gauges                                            | TOOL FEELER GAUGES (Length)                                       | P 32            | P 52                 |
| Infrared thermometer with laser sighting targeting ratio 30 : 1 | TOOL LASERTEMP 301 / IR Thermometer                               | P 33            | P 53                 |



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