MOTION & CONTROL™

NSK

BEARING MOUNTING TOOLS



aip

NSK experts

As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



The NSK company

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, Americas and Asia are linked together in a global technology network. Here we concentrate not only on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

Partnership based on trust – and trust based on quality

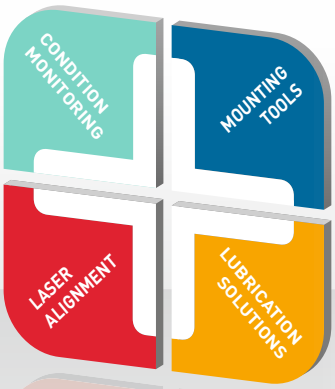
Total Quality by NSK: The synergies of our global network of NSK Technology Centres. Just one example of how we meet our requirements for high quality.

NSK is one of the leading companies with a long tradition in patent applications for machine parts. In our worldwide research centres, we not only concentrate on the development of new technologies, but also on the continual improvement of quality based on the integrated technology platform of tribology, material technology, analysis and mechatronics. **More about NSK at www.nskeurope.com or call us on + 44 (0) 1 636 605 123**



	Page
Why is mounting and dismounting important?	**6**
Mechanical tools	**9**
Fitting Tool Kit FTN333	10
Bearing Puller Kit BPN62	11
Spanner wrenches	12
Hydraulic tools	**13**
Hydraulic pullers	14
Hydraulic pushers	14
Tri-section press plates	16
Hydraulic nuts	17
Hydraulic pumps	22
Induction heaters	**23**
IHN010	24
IHN080	24
IHN120	24
IHN300	25
IHN800	25
Technical data	26

The complete bearing care package



NSK focuses on the care of your bearings with the comprehensive aip+ package. The different maintenance and service tools will give you support for optimum machine performance resulting in life long operation.



Mounting Tools

NSK's range of bearing tools ensures that all components are handled correctly without damage. Having the correct tools for the job ensures that machines are assembled and dismantled correctly and efficiently.



Condition Monitoring

NSK's Condition Monitoring Service keeps track on the pulse of your machine, providing the best health check for running machinery.



Laser Alignment

NSK's alignment tools minimise losses and ensure your machine gives optimum performance with the lowest energy. Over 50% of machines run out of alignment which causes higher loading resulting in lower overall performance.



Lubrication Solutions

Keeping your bearings lubricated is essential for extended lifetime. NSK's range of lubricant solutions will help you achieve the best performance.

Why is mounting and dismounting important?

Correct mounting and dismounting is paramount to get the best performance from your bearings.

Mounting

Bearings are a key component in any moving machinery and must be handled carefully to ensure they perform to their full potential.
Bearings have to be correctly fitted, both onto a shaft and into a housing. This generally means that one ring of the bearing has an interference fit, either on its shaft or in its housing.
The specification of these fits is recommended by NSK in its technical catalogues. Consequently, fitting a bearing requires special tools so that the necessary force is applied to the fitted ring or the components are heated to achieve assembly.
However, these considerations are not always applied leading to the bearing being damaged during the assembly or the removal process. This damage can range from indentations in the bearing raceways to seal deformation or even bearing ring cracking. Similarly, damage to the bearing and its surrounding components during removal can be costly and cause problems with future assembly.
No matter what type of damage, the bearing will not perform according to its designed service life causing premature machine failure and high maintenance costs.

20% **Up to 20% of all bearing problems are caused by poor assembly techniques.**

To overcome these problems, NSK offers a complete range of specialist tools that ensure the bearing is fitted and removed without damage. This is complemented by NSK training courses that teach best practice in using these tools and help engineers to develop safe and efficient assembly procedures.
There are several ways of assembling bearings depending on their design and that of the machinery to which they are fitted:



Cold assembly
This is used for small and medium bearings where force is applied to achieve the required fit. This can be by impact or by use of a press. The force is often applied in a non-uniform manner and to the wrong part of the bearing, so that the full force is borne across the bearing rolling elements and causes permanent damage. NSK's bearing fitting tool prevents any damage and ensures that all of the loads are applied to the bearing ring that is being fitted.



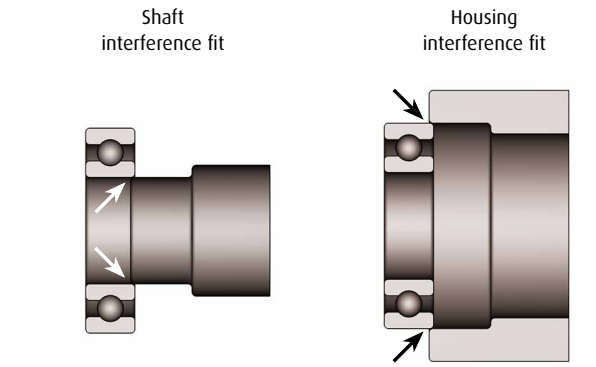


Hydraulic assembly

The use of hydraulic tools allows the degree of force needed to ensure the correct fit of larger bearings. This is particularly relevant for bearings fitted to a tapered shaft or sleeve. The NSK range of tools includes hydraulic nuts for axial drive-up methods, hydraulic pumps and hydraulic pullers/extractors. These ensure that high forces are applied evenly and in a controlled manner, allowing easy assembly or removal of the bearing.

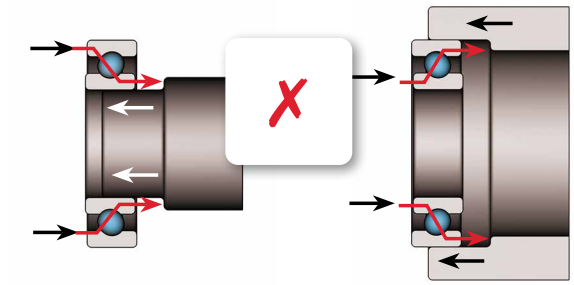
Hot assembly

An alternative to methods involving direct force is the use of heat to expand the bearing rings. This results in an easy sliding fit for the bearing over the shaft. However, heating the bearing requires a precise and uniform application. This was traditionally achieved using oil baths or bearing ovens, but this method can be cumbersome and is fraught with potential problems. A far more effective method is to use a dedicated bearing induction heater. NSK has a range of induction heaters covering different electrical power and bearing weight requirements. They all feature automatic heating cycles, including a monitored measurement of the bearing temperature. This ensures an efficient and rapid heating process together with total control of the desired ring temperature for easy application.



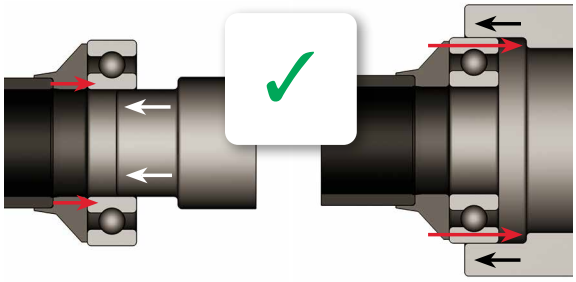
Interference fits – cylindrical bearing shaft

With most bearings, either the inner or the outer ring (in certain cases even both) is mounted onto the shaft or into the housing with an interference fit. Please review NSK's recommended interference fits.



Incorrect mounting

During cold mounting of rolling bearings, it has to be ensured that the mounting forces are always applied to the ring with the interference fit. Mounting forces should never be applied through the rolling elements. The raceway may be damaged if force is applied on the wrong bearing ring.



Correct mounting

The danger of damaging raceways can be minimised by using the specially designed NSK fitting tools. Raceway damage can be prevented with the correct tools.

Dismounting

Bearing extraction and removal

The removal of bearings is a necessary part of routine maintenance and requires care to ensure that no components are damaged during the process. Due to the nature of most machine assemblies, a high removal force is required to overcome the fit between the bearing shaft or housing and the bearing itself. Added to this is the necessary access for removal. Traditional methods such as a hammer and drift or localised heating using a blowtorch can cause costly damage to the shaft or housings by raising burrs and causing heat distortion. NSK's bearing extraction tools can be used to ensure a bearing is removed both safely and with no damage to the surrounding components. These include both mechanical removal tools and hydraulic pullers which can be combined with adjustable tri-section press plates to ensure good contact with the bearing rings.



Mechanical tools

NSK has designed a range of mechanical tools specially designed around its bearings to ensure their fast and efficient fitting and removal.

Fitting Tool Kit FTN333

Small and medium bearings are generally cold-mounted. NSK's fitting tool kit ensures that this is carried out efficiently without damage.



Bearing Puller Kit BPN62

This puller kit can extract deep-groove ball bearings from both shafts and housings without damaging the surrounding components.



Spanner wrenches

Specially designed for locknut fitting and removal on taper bore and sleeve assemblies. These are available in standard and high-impact versions.



Mechanical tools

Fitting Tool Kit FTN333



Minimise the danger of damaging the bearing

The NSK bearing fitting tools are designed for a fast, precise and secure mounting of bearings with bore diameters from 10 to 50mm. The right combination of impact rings and impact sleeves makes sure that the mounting forces are never applied through the rolling elements of a bearing.

- Impact rings are made of extremely shock-resistant material
- Even transmission of force to the bearing rings due to the special construction of the impact rings
- Nylon double-sided hammer head prevents damage effectively
- Also suitable for the fitting of bushings, seals, pulleys, etc.
- Suitable for a wide range of bearing sizes
- Impact rings and impact sleeves are also available individually
- Dead blow hammer FTN333-H included
- No mechanical damage to the bearing during the cold mounting process

Bearing fitting kit range

Rolling bearings from the following series						
						
6000–6015	129	7202B–7213B	3200–3213	21304–21311	204–213	30302–30310
6208–6213	1200–1213	7303B–7311B	3302–3311	22205/10	2204–2210	30203–30210
6300–6311	2200–2213		5200–5213	22205–22213	304–311	32203–32210
6404–6410	1300–1311		5302–5311	22308–22311	2304–2310	32304–32310
16002–16013	2301–2311				1005–1010	31305–31310
98203–98206					305–311	33205–33210
					405–410	

Bearing Puller Kit BPN62

Easy dismounting of ball bearings in blind housings
The BPN62 tool kit in many cases enables the easy dismounting of ball bearings without having to dismantle the shaft. It consists of six puller arm sets and two supporting spindles and is suitable for deep-groove ball bearings with a shaft diameter from 10 to 100mm.

- Six puller arm sets and two spindles in a display case weighing only 3.2kg
- Hinged puller arms for power transmission to the bearing
- User-friendly thanks to the elastic locking ring that keeps the puller arms in the right position
- Puller arms made of high-quality steel
- Selection chart for deep-groove ball bearings inside the case



Bearing puller kit range

Ball bearing type						
60..	62..	63..	64..	62../63..	16...	161...
6000–6020	6200–6217	6300–6313	6403–6410	62/22 62/28 63/22 63/28	16002–16011	16100 16101

Mechanical tools

Spanner wrenches



NSK spanner wrenches for locknuts

The NSK range of locknut spanners is designed for the safe installation and removal of locknut assemblies without the damage caused when other methods are used.

- A simple and inexpensive means of installing locknuts for taper bore mounting
- Suitable for shafts, taper and adapter sleeves
- Positive location on the locknut, clamping into the slot ensures no damage to the locknut
- Standard range made from thick steel plate
- Impact range made with forged steel heads welded to alloy steel handles with easy grip rubber cover
- Impact range designed with broad head to absorb heavy blows and impact forces from hammers

Wrench part number	Locknut part number		
	Metric	Inch	NSK
HN1	KM1	N01	
HN2	KM2	N02	AN02
HN3	KM3	N03	AN03
HN4	KM4	N04	AN04
HN5	KM5	N05	AN05
HN6	KM6	N06	AN06
HN7	KM7	N07	AN07
HN8	KM8	N08	AN08
HN9	KM9	N09	AN09
HN10	KM10	N10	AN10
HN11	KM11	N11	AN11
HN12	KM12	N12	AN 12
HN13	KM13	N13	AN13
HN14	KM14	N14	AN14
HN15	KM15	AN15	AN15
HN16	KM16	AN16	AN16
HN17	KM17	AN17	AN17
HN18	KM18	AN18	AN18
HN19	KM19	AN19	AN19
HN20	KM20	AN20	AN20
HN21	KM21	AN21	AN21
HN22	KM22	AN22	AN22

Impact wrench part number	Locknut part number**							
	Locknut series	KM	HM..T	HML..T	HM30	HM31	AN-00	N-00
HN IMPACT 23-30	Locknut number	23–30	*	*	*	*	24–30	026–032
HN IMPACT 30-40		30–40	*	41–42	*	*	30–40	034–040
HN IMPACT 40-52		40–52	41–0	41–54	44–52	*	40–44	044–052

* Locknut of this size does not exist in this series.
** All locknut series have letter and number part numbers (i.e. AN-24).

Hydraulic tools

Standard mechanical tools are inadequate for large or heavy-duty applications, which is why hydraulic equipment has to be used. NSK's range of hydraulic tools ensures easy fitting and removal as well as the application of high loads in a controlled and safe manner.

Hydraulic pushers, Pullers and press plates

High loads are necessary to achieve a recommended fit between bearing and mounting surface, and NSK's range of hydraulic pushers, pullers and press plates is ideal for the job.



Hydraulic nuts

A hydraulic nut is ideal to apply greater force progressively and parallel to the shaft for larger bearings that are mounted on a shaft or sleeve.



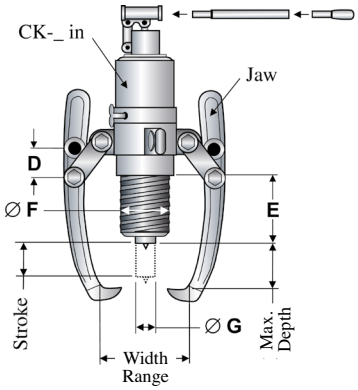
Hydraulic pumps

NSK's range of hydraulic pumps can be used in conjunction with hydraulic nuts or for oil galleries created to remove bearings from tapered shafts.



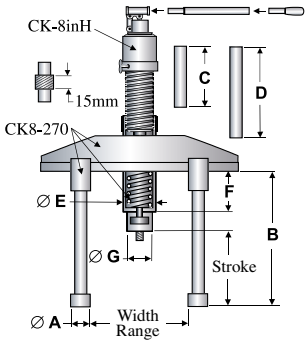
Hydraulic tools

Hydraulic pullers



- Self-contained hydraulic puller, no need for extra hand pump, hose and coupling, allows operation by one person
- 2 or 3 jaw combination puller head
- Jaws in two lengths, user can choose jaws according to needs (CK-10inB)
- 360° rotary handle with swivel clevis allows pumping from all directions
- Fast-adjusting nut for speedy adjustment
- Safety valve minimises the risk of a puller overload by limiting the applied force
- Complete hydraulic puller allows effortless generation of force and dismounting
- The spring-loaded centre point of the hydraulic spindle allows easy centring of the puller on the shaft
- Forged parts and special treatment ensure a long-life service and the best strength
- Cobra Jaws have a higher load capacity and are stronger than standard models

Hydraulic pushers



- Self-contained hydraulic pusher including hydraulic pump and swivel handle allowing operation by one person
- Can be used to install a wide variety of press fit parts quickly and easily
- Ideal for mounting bushes, wheels, bearings, gears, pulleys, etc.
- Three-leg design provides stability and ensures forces are distributed equally
- Legs available in three lengths to meet different demands
- Equipped with a gauge and safety valve to indicate the force applied and to minimise overloading
- Complete hydraulic pusher allows effortless generation of force for easy installation

Hydraulic puller – integrated puller and pump

Product description	Capacity	Part number	Max depth	Width range	Stroke	Weight
	Ton max		mm	mm	mm	kg
Standard jaws	4	CK-6SD	165	30–200/260	55–105	7.2
	6	CK-6IN	165	30–200/260	82–130	7.5
	8	CK-8IN	210	30–250/355	82–160	9.7
	15	CK-10IN	240	50–280/380	82–180	11.1
Long jaws	6	CK-6INL	195	30–200/300	82–180	8.8
	8	CK-8INL	240	30–300/380	82–240	11.1
	15	CK-10INL	320	50–350/410	82–280	26.2
Standard and long jaw kit	6	CK-6INB	165/195	30–260/300	82–180	10.3
	8	CK-8INB	210/240	30–300/380	82–240	13.1
	15	CK-10INB	240/320	50–350/410	82–280	28.4
Cobra Jaws – standard	10	CK-6IN Extra	195	30–250/310	82–130	10.7
	12	CK-8IN Extra	240	30–300/370	82–160	19.0
	20	CK-11IN	275	50–360/430	82–180	24.6
	25	CK-12IN	315	50–410/480	110–220	34.8
	30	CK-15IN	405	100–540/610	110–260	52.6
Cobra Jaws – long	10	CK-6INL Extra	250	30–280/340	82–180	18.3
	12	CK-8INL Extra	280	30–330/400	82–240	23.3
	20	CK-11INL	330	50–380/450	82–280	29.3
	25	CK-12INL	380	50–440/540	110–330	43.8
Cobra Jaws – standard and long jaw kit	10	CK-6INB Extra	195/250	30–280/340	82–180	14.1
	12	CK-8INB Extra	240/280	30–330/400	82–240	24.0
	20	CK-11INB	275/330	50–380/450	82–280	32.8
	25	CK-12INB	315/380	50–440/540	110–330	64.3

Hydraulic puller – separate puller and pump

Product description	Capacity	Part number	Max depth	Width range	Stroke	Weight
	Ton max		mm	mm	mm	kg
Standard jaws	15	CK-105	240	50-280/380	82-180	26.0
	22.5	CK-135	315	50-410/480	110-220	39.5
Long jaws	15	CK-105L	320	50-350/410	82-280	22.1
	22.5	CK-135L	380	50-440/540	110-330	49.2
	27.5	CK-155	405	50-540/610	110-260	53.5
Standard and long jaw kit	15	CK-105B	240/320	50-350/410	82-280	34.1
	22.5	CK-135B	315/380	50-440/540	110-330	51.2
Cobra Jaws – standard	15	CK-105 Extra	275	50-360/430	82-180	30.3
	50	CK-25INS Extra	465	580-750	125-275	123.3
Cobra Jaws – long	15	CK-105L Extra	330	50-380/450	82-280	35.2
	50	CK-25INL Extra	635	580-1000	125-425	133.5
Cobra Jaws – standard and long jaw kit	15	CK-105B Extra	275/330	50-380/450	82-280	37.9
	50	CK-25IN Extra	465/635	580-1000	125-425	167.2

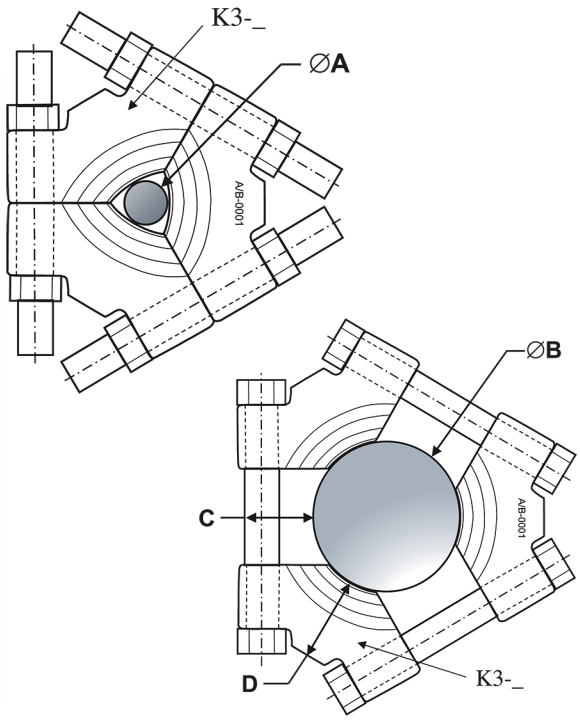
Hydraulic pusher

Product description	Capacity	Part number	Max depth	Width range	Stroke	Weight
	Ton max		mm	mm	mm	kg
Integrated pump	12	CK8-270A	–	58-270	82	33.7
Seperate pump	12	CK8-270C	–	58-270	82	32.6
Without pump	12	CK8-270	–	58-270	82	30.1

Hydraulic tools

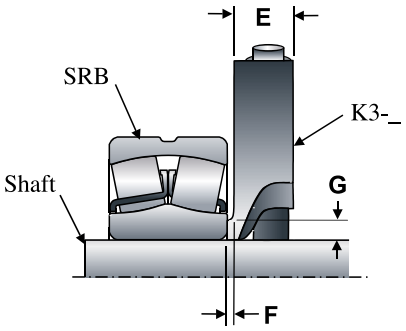
Tri-section press plates





NSK's range of tri-section press plates is an ideal supplement to our hydraulic pullers and is specially designed to accept the puller jaws.

- Assembly designed to ensure forces are applied to the mounted bearing ring without slipping or damage
- Tri-section press plates clamp over the shaft and apply pressure from the specially designed raised lips
- Hydraulic puller arms lock onto purpose-designed lugs to ensure a firm set-up



Part number	Capacity	Shaft size		Dimensions					Weight
	Ton max	A	B	C	D	E	F	G	kg
		mm		mm					
K3-50	8	12	50	20	26	15	2	4	0.5
K3-100	20	26	100	36	45	25	3	6	2.8
K3-160	30	50	160	45	60	33	4	8	6.5
K3-260	45	90	260	70	88	47	6	11	19.5
K3-380	60	140	380	81	112	63	8	14	48.4

Hydraulic nuts

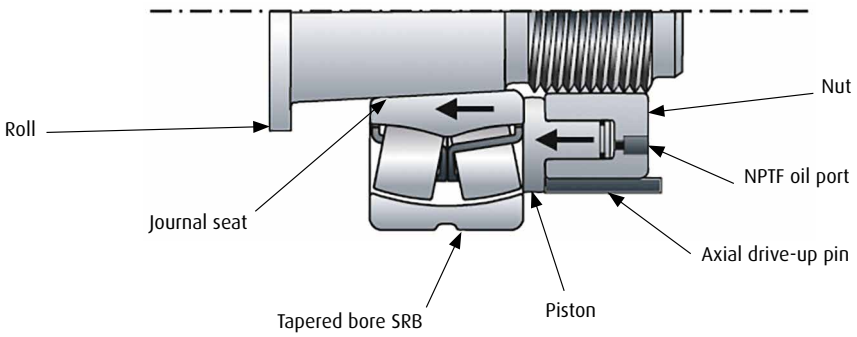






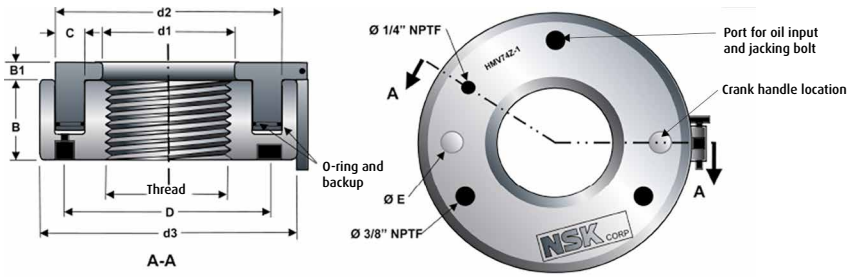
Hydraulic nuts from NSK use an axial drive-up method to ensure the accurate and quick installation of tapered bore bearings. The axial drive-up method ensures that the internal clearance and interference fits are correct by monitoring the movement of the piston, and thus the bearing's inner ring, in relation to the hydraulic nut. This method minimises the need to continually check the clearance reduction with feeler gauges.

- NSK hydraulic nuts are fitted with a patented axial drive-up pin to facilitate their set-up
- The pin determines the required travel to ensure the bearing is precisely located, eliminating the need for dial indicators and specialist information
- NSK hydraulic nuts are coated with Armaloy to provide an anti-rust layer, making them durable and robust
- Cranking rods, jack-out bolts and wrenches are included and eye bolt threads are provided for large sizes
- All components come in a secure carrying case



Hydraulic tools

Hydraulic nuts



Hydraulic nut part numbers*	Bearing bore size ***		Dimensions (mm)							
HMV()-1	Bore symbol	Bore (mm)	d1	d2	d3	B	B1	D	E	C
50	10	50	50.5	84	114	38	4	72	12.7	13.0
55	11	55	55.5	89	120	38	4	76	12.7	13.0
60	12	60	60.5	95	125	38	5	81	12.7	13.0
65	13	65	65.5	101	130	38	5	88	12.7	13.0
70	14	70	70.5	107	135	38	5	95	12.7	13.0
75	15	75	75.5	112	140	38	5	100	12.7	13.0
80	16	80	80.5	117	146	38	5	106	12.7	13.0
85	17	85	85.5	122	150	38	5	110	12.7	13.0
90	18	90	90.5	127	156	38	5	116	12.7	13.0
95	19	95	95.5	133	162	38	5	122	12.7	13.0
100	20	100	100.5	138	166	38	6	126	12.7	13.0
105	21	105	105.5	143	172	38	6	130	12.7	13.0
110	22	110	110.5	149	178	38	6	136	12.7	13.0
115	n/a	n/a	115.5	154	182	38	6	141	12.7	13.0
120	24	120	120.5	159	188	38	6	146	12.7	13.0
125	n/a	n/a	125.5	164	192	38	6	151	12.7	13.0
130	26	130	130.5	170	198	38	6	156	12.7	13.0
135	n/a	n/a	135.5	175	204	38	6	161	12.7	13.0
140	28	140	140.5	180	208	38	7	166	19	13.0
145	n/a	n/a	145.5	186	214	39	7	171	19	13.5
150	30	150	150.5	191	220	39	7	176	19	13.5
155	n/a	n/a	155.5	198	226	39	7	183	19	14.0
160	32	160	160.5	204	232	40	7	190	19	14.5
165	n/a	n/a	165.5	209	238	40	7	195	19	14.5
170	34	170	170.5	215	244	41	7	200	19	15.0
180	36	180	180.5	227	256	41	7	212	19	15.5
190	38	190	191	239	270	42	8	230	19	16.5
200	40	200	201	251	282	43	8	241	19	17.0
205	n/a	n/a	207	256	288	43	8	247	19	17.0
210	n/a	n/a	212	262	294	44	8	252	19	17.5
215	n/a	n/a	217	267	300	44	8	258	19	17.5
220	44	220	222	273	306	44	8	263	19	18.0
225	n/a	n/a	227	280	312	45	8	269	19	18.5
230	n/a	n/a	232	285	318	45	8	274	19	18.5
235	n/a	n/a	237	291	326	46	8	281	19	19.0
240	48	240	242	296	330	46	9	285	19	19.0
250	n/a	n/a	252	307	342	46	9	296	19	19.5
260	52	260	262	319	356	47	9	308	19	20.0
270	n/a	n/a	272	330	368	48	9	319	19	20.5
280	56	280	282	341	380	49	9	330	19	21.0
290	n/a	n/a	292	353	390	49	9	340	19	21.5
300	60	300	302	364	404	51	10	352	19	22.5
310	n/a	n/a	312	375	416	52	10	363	19	22.6

* Inch threads on request.

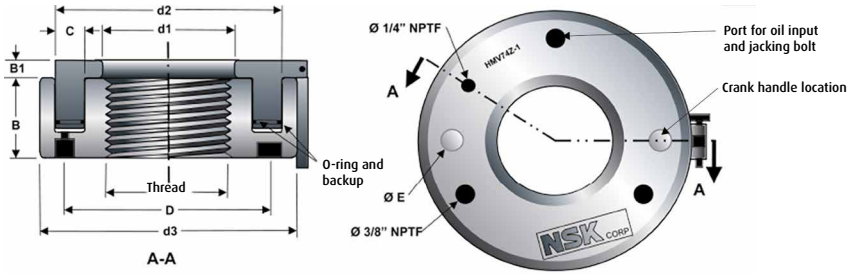
** Metric threads for HMV49-1 to HMV200-1 are ISO 965/111-1980 tolerance class 6H. Metric threads for HMV205-1 to HMV1000-1 are ISO 2901-1977 tolerance class 7H.

Properties			Thread **	1:12 (mm) axial displacement		1:30 (mm) axial displacement	
Piston stroke (mm)	Piston area (cm^2)	Mass (kg)		min.	max.	min.	max.
5	29	2.70	M50x1.5	0.45	0.55	n/a	n/a
5	31	2.75	M55x2				
5	33	2.80	M60x2				
5	36	3.00	M65x2				
5	38	3.20	M70x2	0.60	0.70	n/a	n/a
5	40	3.40	M75x2				
5	42	3.70	M80x2				
5	45	3.75	M85x2	0.70	0.85	1.75	2.15
5	47	4.00	M90x2				
5	49	4.30	M95x2				
5	51	4.40	M100x2				
5	53	4.65	M105x2	0.75	0.90	1.90	2.25
5	56	4.95	M110x2				
5	58	5.00	M115x2				
5	60	5.25	M120x2				
5	62	5.25	M125x2	0.90	1.10	2.25	2.75
5	64	5.65	M130x2				
5	66	5.65	M135x2				
5	68	6.00	M140x2				
5	73	6.50	M145x2	1.00	1.30	2.50	3.25
5	75	6.60	M150x2				
5	81	6.95	M155x3				
6	86	7.60	M160x3				
6	89	7.90	M165x3	1.10	1.40	2.75	3.50
6	94	8.40	M170x3				
6	103	9.15	M180x3				
7	115	10.5	M190x3	1.30	1.60	3.25	4.00
8	125	11.5	M200x3				
8	128	12.0	Tr205x4	1.40	1.70	3.50	4.25
9	134	12.5	Tr210x4				
9	137	13.0	Tr215x4				
9	144	13.5	Tr220x4				
9	152	14.5	Tr225x4				
9	155	15.5	Tr230x4	1.60	1.90	4.00	4.75
10	162	16.0	Tr235x4				
10	165	16.0	Tr240x4				
10	176	17.5	Tr250x4				
11	188	19.0	Tr260x4	1.70	2.20	4.25	5.50
12	199	20.5	Tr270x4				
12	211	22.0	Tr280x4				
13	224	22.5	Tr290x4	1.90	2.40	4.75	6.00
14	236	25.5	Tr300x4				
14	250	27.0	Tr310x4				

*** Mounted directly on a tapered shaft or an adapter sleeve. If mounted on a removal sleeve, choose next smallest metric size.
n/a = ISO bearing and standard inch hydraulic nut size does not exist for direct mounting on a shaft or on an adapter sleeve.
Contact NSK for non-standard sizes.

Hydraulic tools

Hydraulic nuts



Hydraulic nut part numbers*	Bearing bore size ***		Dimensions (mm)							
HMV()-1	Bore symbol	Bore (mm)	d1	d2	d3	B	B1	D	E	C
320	64	320	322	387	428	53	10	374	19	23.0
330	n/a	n/a	332	397	438	53	10	384	19	23.0
345	n/a	n/a	347	414	456	54	10	401	19	24.0
350	n/a	n/a	352	420	464	56	10	407	19	24.0
360	72	360	362	431	472	56	10	416	19	24.5
365	n/a	n/a	367	436	482	57	11	424	19	24.5
370	n/a	n/a	372	442	486	57	11	428	19	25.0
385	n/a	n/a	387	459	504	58	11	445	25.4	25.5
400	80	400	402	475	522	60	11	461	25.4	26.0
410	n/a	n/a	412	486	534	61	11	472	25.4	26.5
420	84	420	422	498	546	61	11	483	25.4	27.0
430	n/a	n/a	432	508	558	62	11	494	25.4	27.0
440	88	440	442	519	566	62	12	503	25.4	27.5
450	n/a	n/a	452	530	580	64	12	515	25.4	28.0
460	92	460	462	541	590	64	12	525	25.4	28.0
470	n/a	n/a	472	552	602	65	12	536	25.4	28.5
480	96	480	482	563	612	65	12	546	25.4	29.0
490	n/a	n/a	492	573	624	66	12	557	25.4	29.0
500	/500	500	502	585	636	67	12	568	25.4	29.5
510	n/a	n/a	512	596	648	68	12	579	25.4	30.0
520	n/a	n/a	522	606	658	68	13	589	25.4	30.0
530	/530	530	532	617	670	69	13	600	25.4	30.5
540	n/a	n/a	542	629	682	69	13	611	25.4	31.0
550	n/a	n/a	552	639	693	70	13	622	25.4	31.0
560	/560	560	562	650	704	71	13	632	25.4	31.5
570	n/a	n/a	572	661	716	72	13	643	25.4	32.0
580	n/a	n/a	582	671	726	72	13	653	25.4	32.0
600	/600	600	602	693	748	73	13	674	25.4	32.5
630	/630	630	632	726	782	74	14	706	25.4	33.5
650	n/a	n/a	652	747	804	75	14	727	25.4	33.5
670	/670	670	672	768	826	76	14	748	25.4	33.5
690	n/a	n/a	692	792	848	77	14	769	25.4	34.2
710	/710	710	712	812	870	78	15	790	25.4	34.7
750	/750	750	752	862	912	79	15	831	25.4	35.8
800	/800	800	802	909	965	80	16	883	25.4	36.8
850	/850	850	852	960	1020	83	16	935	25.4	38.3
900	/900	900	902	1012	1075	86	17	988	25.4	39.4
950	/950	950	952	1065	1126	86	17	1038	25.4	40.9
1000	/1000	1000	1002	1123	1180	88	17	1090	25.4	41.9

* Inch threads on request.
** Metric threads for HMV49-1 to HMV200-1 are ISO 965/111-1980 tolerance class 6H. Metric threads for HMV205-1 to HMV1000-1 are ISO 2901-1977 tolerance class 7H.

Properties			Thread **	1:12 (mm) axial displacement		1:30 (mm) axial displacement	
Piston stroke (mm)	Piston area (cm^2)	Mass (kg)		min.	max.	min.	max.
14	263	29.5	Tr320x5	2.20	2.70	5.50	6.75
14	270	30	Tr330x5				
14	294	32.5	Tr345x5				
14	299	35	Tr350x5				
15	313	35.5	Tr360x5	2.40	3.00	6.00	7.50
15	317	38.5	Tr365x5				
16	328	39	Tr370x5				
16	347	41	Tr385x5				
17	367	45.5	Tr400x5				
17	383	48	Tr410x5	2.70	3.30	6.75	8.25
17	400	50	Tr420x5				
17	408	52.5	Tr430x5				
17	425	54	Tr440x5				
17	442	57.5	Tr450x5				
17	451	60	Tr460x5	3.00	3.70	7.50	9.25
18	469	62	Tr470x5				
19	487	63	Tr480x5				
19	496	66	Tr490x5				
19	515	70	Tr500x5				
20	533	74	Tr510x6	3.40	4.30	8.50	11.00
20	543	75	Tr520x6				
21	562	79	Tr530x6				
21	582	81	Tr540x6				
21	592	84	Tr550x6				
22	612	88	Tr560x6				
23	632	91	Tr570x6	3.70	4.80	9.25	12.00
23	642	94	Tr580x6				
23	674	100	Tr600x6				
23	729	110	Tr630x6				
23	761	115	Tr650x6	4.20	5.30	10.50	13.00
24	802	120	Tr670x6				
25	842	127	Tr690x6				
25	878	135	Tr710x7				
25	953	146	Tr750x7	4.50	5.90	11.50	15.00
25	1040	161	Tr800x7				
26	1145	181	Tr850x7	5.00	6.60	12.50	16.50
30	1242	205	Tr900x7				
30	1357	218	Tr950x8	5.50	7.40	14.00	18.50
34	1459	239	Tr1000x8				

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n/a = ISO bearing and standard inch hydraulic nut size does not exist for direct mounting on a shaft or on an adapter sleeve.
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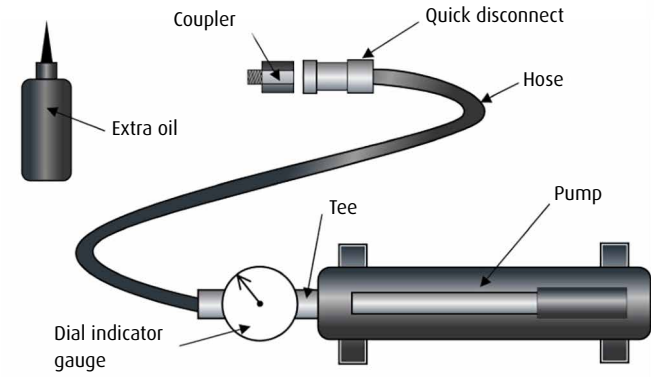
Hydraulic tools

Hydraulic pumps

NSK offers hydraulic pumps that inject oil into hydraulic nuts during bearing installation and simplify the bearing removal process by pumping oil between the inner ring and journal.

- Two sizes depending on capacity needed
- Pump kit includes: pump, hose, quick-disconnect coupling, gauge, tee, extra oil and metal case
- All pumps include a safety relief valve set to 690 bar





Part number	Pump description	Max working pressure	Useful oil capacity	Oil displacement per stroke	Max handle effort	Piston stroke	Weight	Pump dimensions (mm)		
		bar	ml	cm^3	kg	mm	kg	L	W	H
PUMP HSS LARGE	Hand pump Single speed	690	800	2.5	11	25	7.50	560	140	140
PUMP HSS SMALL	Hand pump Single speed	690	500	3.0	11	25	6.0	385	140	135

Induction heaters

NSK can offer a range of compact and efficient induction heaters in different sizes based on weight and power requirements. Each heater is designed for a range of bearings and includes both temperature- and time-based controller modules.

Induction heaters

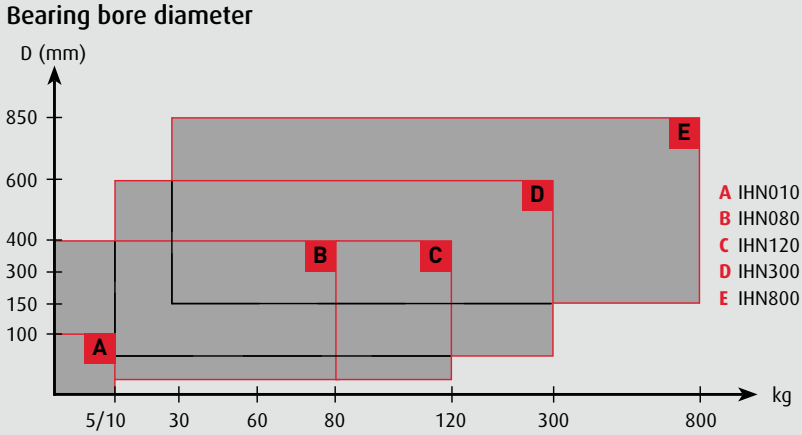
Using specially designed induction coils, NSK bearing heaters will ensure your bearings are safely and efficiently heated to the optimum temperature for easy hot mounting.





The suitable heater for your application

The choice of an NSK induction heater depends largely on the geometrical dimensions and the weight of the work-piece you want to heat. The chart serves as a guide to selection.



Induction heaters

IHN010

The lightweight, portable device with a convincing performance for bearings up to 10kg

- Portable, compact and very light (3.5kg)
- A bearing weighing 5kg can be heated up to 110°C in less than four minutes
- Silent operation
- No support yoke required – simply place the workpiece on the device
- Predictive temperature control (PTC) software for automatic temperature monitoring



IHN080

The perfect choice to heat small and medium-sized bearings weighing up to 80kg

- Available in two power versions: 230V/50Hz and 110V/60Hz
- Three yokes are included
- Very compact design, 35kg overall weight including three yokes
- Swivel arm available as an optional extra
- Other power versions are available on request



IHN120

The best solution to heat small and medium-sized bearings weighing up to 120kg and for permanent operation

- Available in two power versions: 400V/50Hz and 460V/60Hz
- Three yokes are included
- Very compact design, 38kg overall weight including three yokes
- Swivel arm is included
- Fan radiator for permanent operation is included
- Other power versions are available on request



IHN300

The IHN300 is a large and exceptionally powerful high-end induction heater for larger bearings up to 300kg

- Available in two power versions: 400V/50Hz and 460V/60Hz
- A sliding arm permits easy placement and removal of the bearing
- Two yokes are included
- Compact design, 75kg overall weight including two yokes
- A fan version, IHN300F, for permanent operation is available upon request
- Other power versions are available on request



IHN800

Fast and safe heating of large workpieces

- Fast heating of extremely large components, e.g. a bearing weighing 445kg, can be heated up up to 110°C in only ten minutes (temperature at the inner ring)
- Designed for easy transport using a forklift truck
- Automatic demagnetisation of the workpiece



Induction heaters

Technical Data





Designation	IHN010	IHN080
Workpiece		
- maximum weight	10kg	80kg
- minimum bore	20mm	20mm
- maximum outside diameter	160mm	600mm
- maximum thickness	60mm	145mm
Voltage V/Hz *	100V 10.5 A 1.05 kVA (made to order) 115V 10.5 A 1.2 kVA 230V 6.5 A 1.5 kVA	110V/60Hz 230V/50Hz
Temperature control		
- range	20 - 180°C	0 – 250°C
- magnetic probe	yes, type K	yes, type K
Time control		
- range	0 - 10 minutes	0 – 60 minutes
- accuracy	± 6 seconds	± 0.01 seconds
Maximum temperature (approx.)	180°C	400°C
Thermometer mode	yes	yes
Bearing temperature mode	no	yes
Automatic demagnetisation	yes	yes
Can heat sealed bearings	yes	yes
Can heat pre-greased bearings	yes	yes
Thermal overload protection	yes	yes
Size of the operating area (W x H)	– –	145 x 205mm
Coil diameter	–	115mm
Dimensions (W x D x H)	340 x 250 x 64mm (over cone 121mm)	420 x 280 x 345mm
Overall weight including yokes	3.5kg	35kg
Maximum power consumption	1.4/1.5kVA	3.7/2.2kVA
Number of standard yokes	–	3
Standard yokes	–	55 x 55 x 275mm for bearings with bore diameters of 78mm 28 x 28 x 275mm for bearings with bore diameters of 40mm 14 x 14 x 275mm for bearings with bore diameters of 20mm
Core cross section	–	55 x 55mm
Housing material	Plastic	Aluminium

*Other power versions are available upon request.







IHN120	IHN300	IHN800
120kg	300kg	up to 1200kg
20mm	60mm	142mm
600mm	850mm	1.2m
145mm	250mm	330mm
400V/50Hz – 460V/60Hz 500V/50Hz – 575V/60Hz (made to order)	400V/50Hz – 460V/60Hz 500V/50Hz – 575V/60Hz (made to order)	400V/50Hz – 460V/60Hz 500V/50Hz – 575V/60Hz (made to order)
0 – 250°C	0 – 250°C	0 – 250°C
yes, type K	yes, type K	yes, type J
0 – 60 minutes ± 0.01 seconds	0 – 60 minutes ± 0.01 seconds	0 – 60 minutes ± 0.01 seconds
400°C	400°C	400°C
yes	yes	yes
yes	yes	yes
yes	yes	yes
yes	yes	yes
yes	yes	yes
yes	yes	yes
145 x 205mm	250 x 250mm	330 x 355mm
115mm	135mm	186mm
420 x 280 x 420mm	600 x 350 x 420mm	750 x 400 x 935mm
38kg	75kg	300kg
6.4/7.4 kVA	10/11.5 kVA	24/27.6 kVA
3	2	1
55 x 55 x 275mm for bearings with bore diameters of 78mm 28 x 28 x 275mm for bearings with bore diameters of 40mm 14 x 14 x 275mm for bearings with bore diameters of 20mm	70 x 70 x 420mm for bearings with bore diameters of 100mm 40 x 40 x 420mm for bearings with bore diameters of 60mm	100 x 100 x 570mm for bearings with bore diameters of 142mm
55 x 55mm	70 x 70mm	100 x 100mm
Aluminium	Aluminium	Steel

MOTION & CONTROL™

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