



**NISHIATSU HYDRAULIC PRODUCTS**

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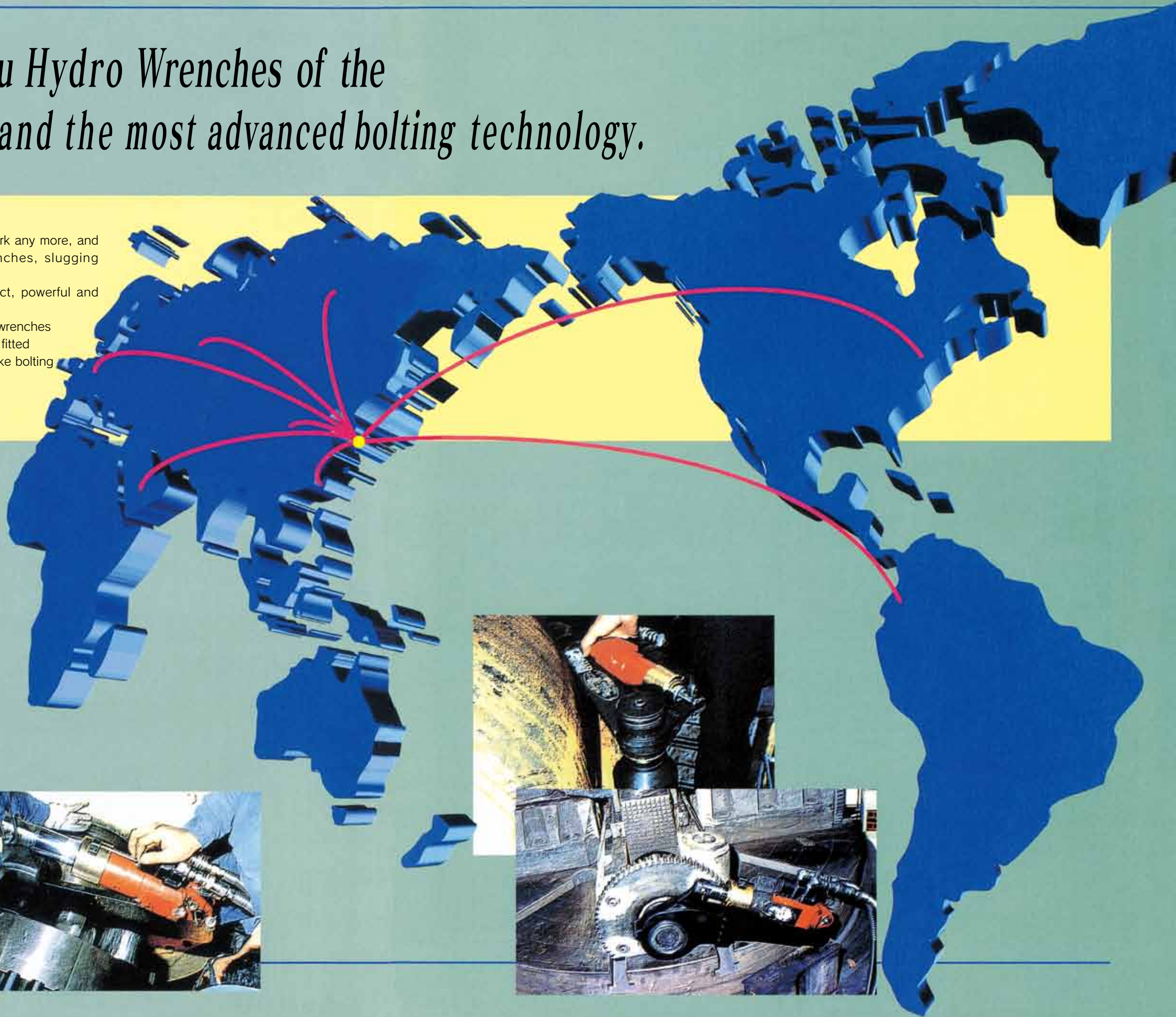
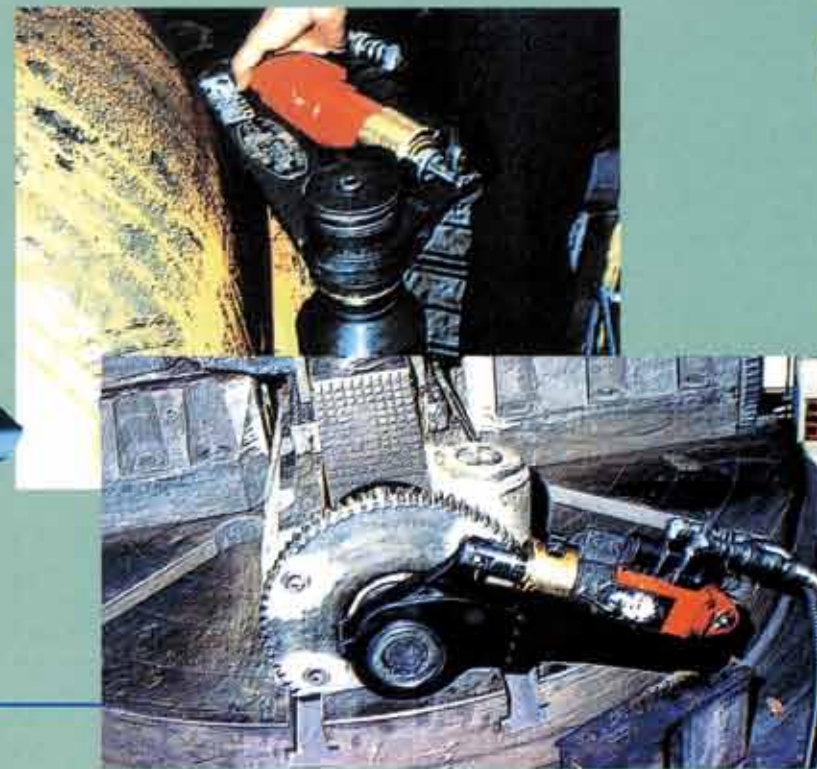
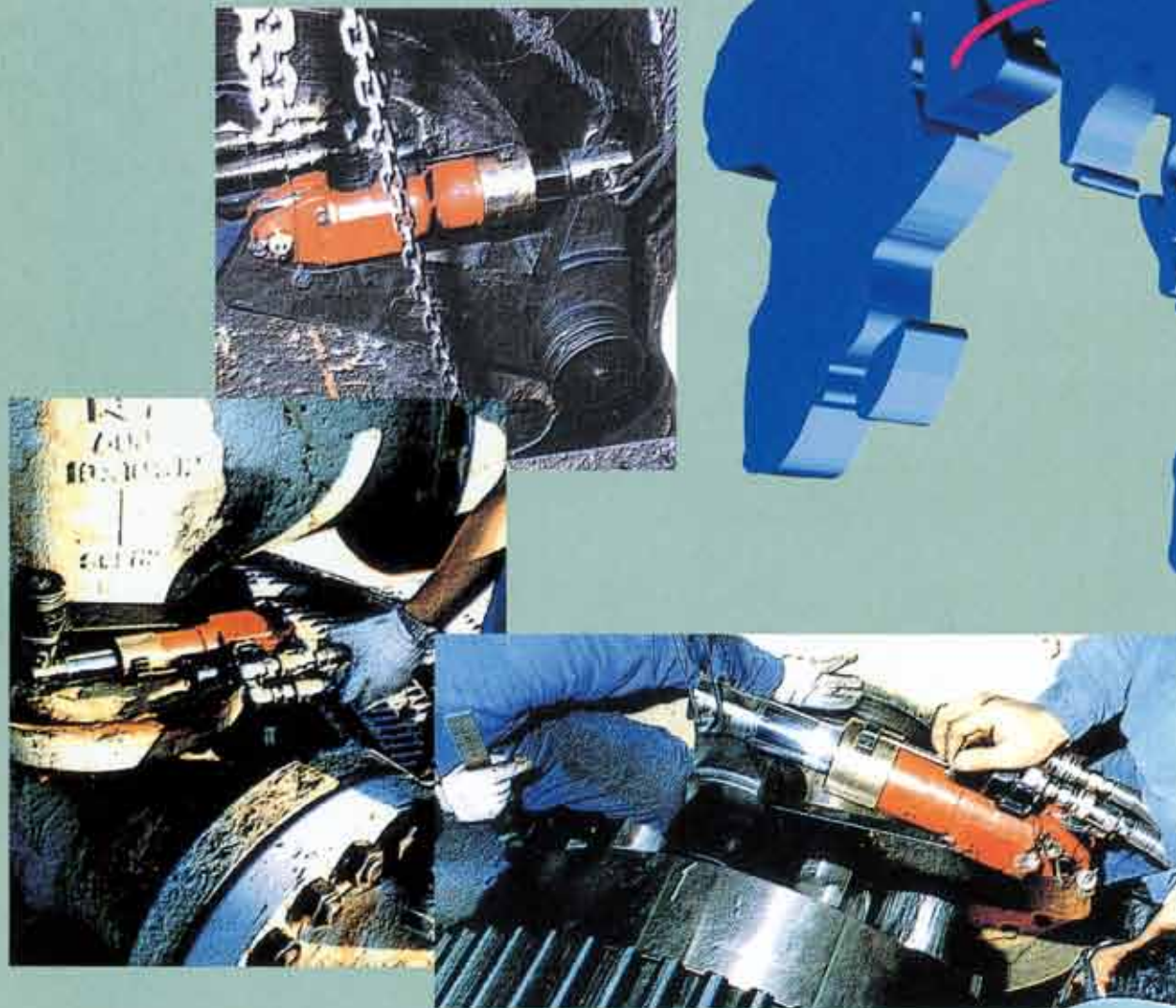
**TORQUE WRENCH  
GENERAL PAMPHLET**



# *Called "Yes" Nishiatsu Hydro Wrenches of the highest performance and the most advanced bolting technology.*

Heavy duty bolt connections are not left to guesswork any more, and such conventional methods as air impact wrenches, slugging wrenches, etc. are not longer acceptable.

NISHIATSU advanced Hydro wrenches are compact, powerful and versatile, and provide full automatic and continuous bolting operations. What differentiates these Hydro wrenches from other makers` is that the wrenches are specially fitted with the patented automatic shuttle valves, which make bolting much easier, faster and more accurate.



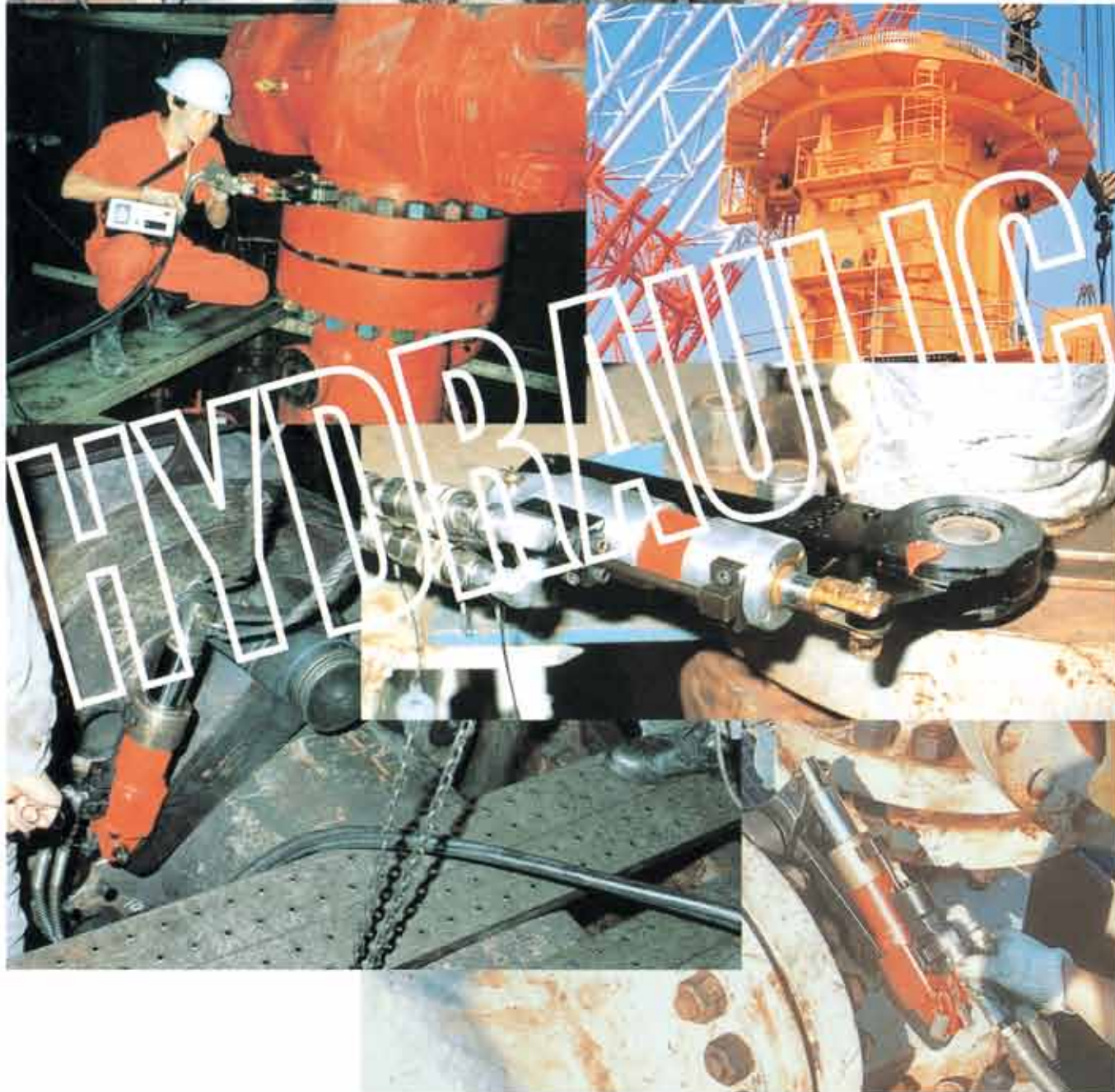


# HYDRO WRENCH POWER WORKS

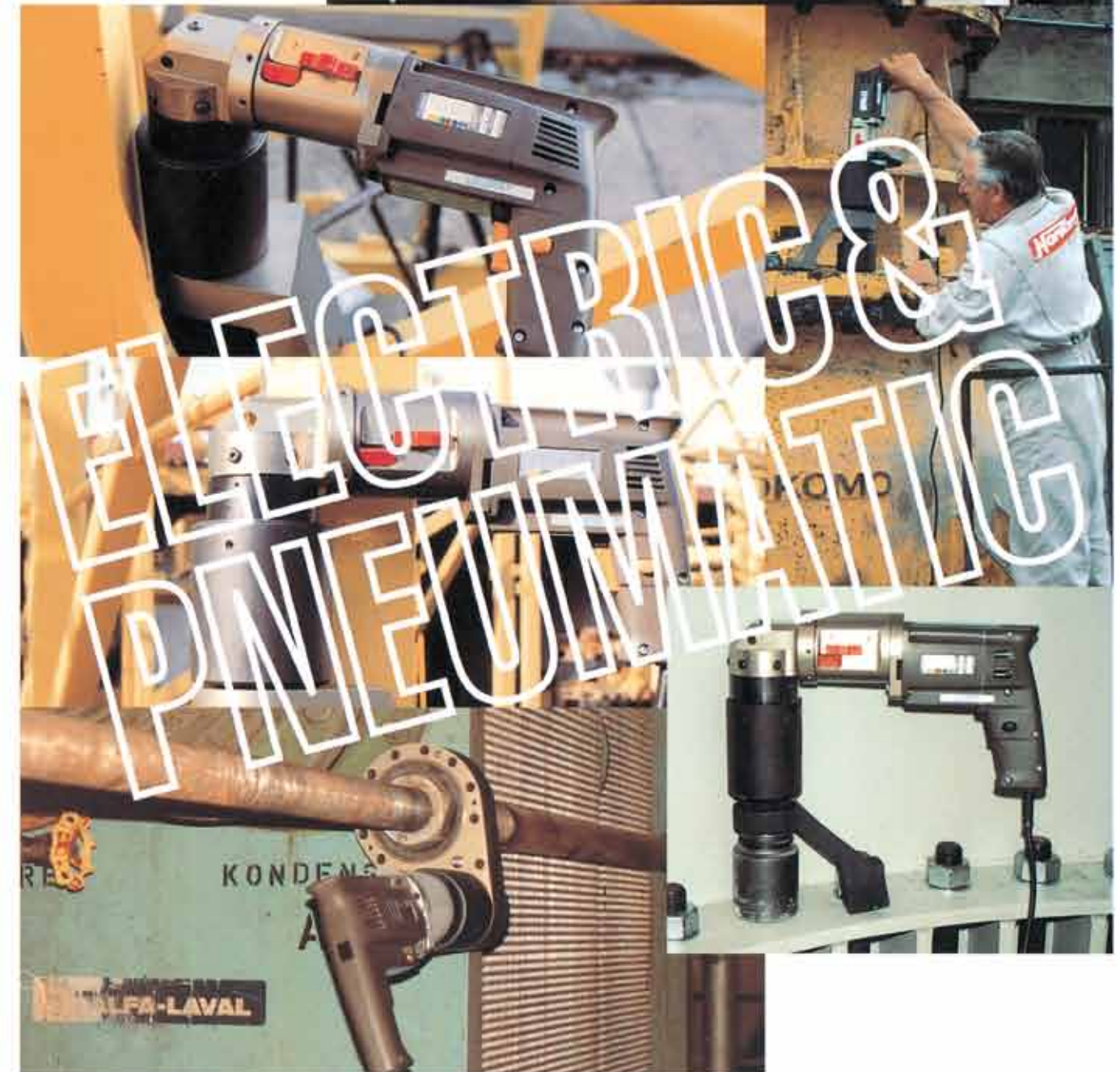
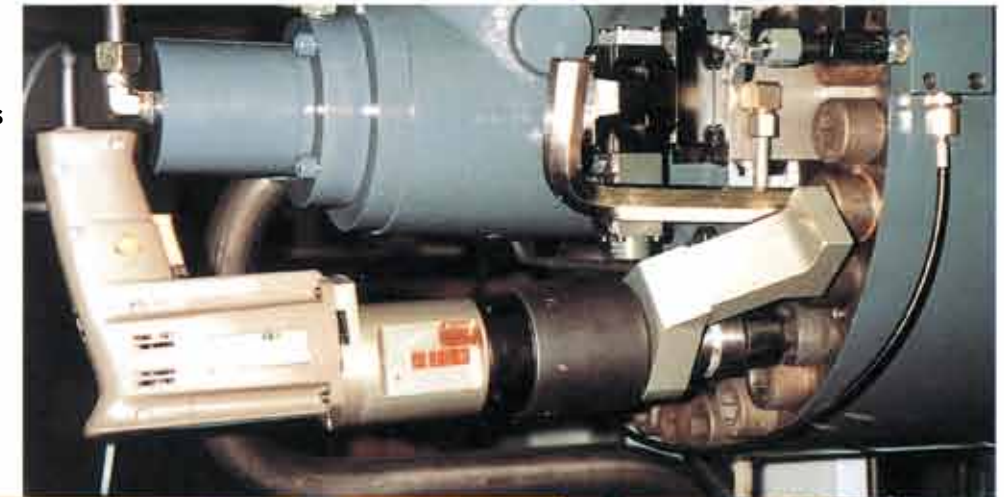


## Applications & uses

- Power stations
- Shipbuilding yards
- Steel mills
- Petrochemical plants
- Cement plants
- Transport/motor plants
- Oil drilling/refining
- Pressure vessels & heat exchangers
- Building/construction machines
- Bridge construction
- Oil pipe lines
- Paper & pulp mills
- Machine tools
- Water supply & drainage
- Maintenance shops
- Segments & others

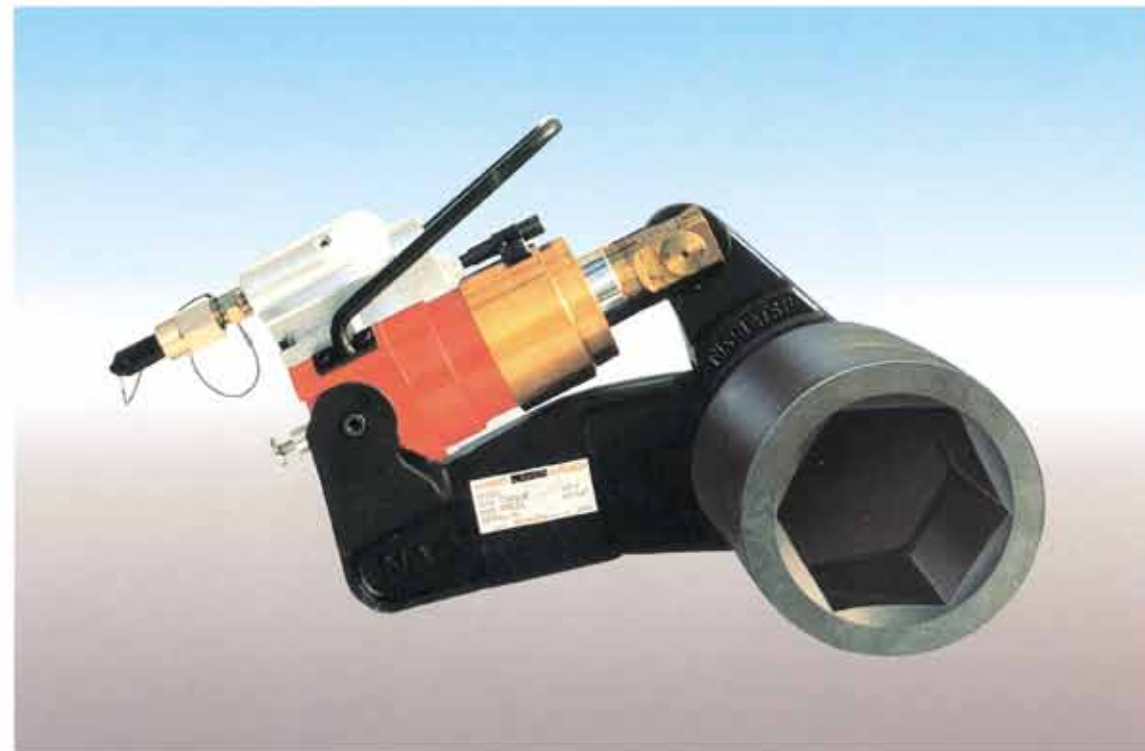


# ELECTRIC & PNEUMATIC WRENCH POWER WORKS





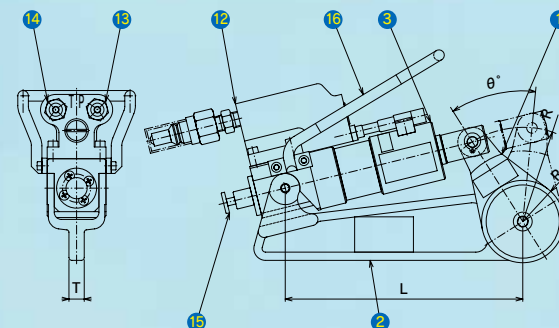
# N-SERIES (hydraulic)



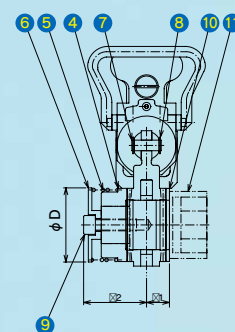
- Auto reciprocating mechanism
- Very easy torque presetting
- Auto stopping mechanism
- Continuous tightening
- Remote control operation

"N" series wrenches are most popular type and used with standard impact sockets in general applications. Thanks to the auto shuttle valves mounted on wrenches, the electric pumps drive them automatically and continuously and switch off automatically immediately after the preset pressure has been attained.

The wrenches have the patented two plane-teeth ratchet for higher strength, instead of the conventional dual pawl ratchet mechanism, so they have been designed to withstand rigours of site work.



Model	L-250N	L-500N	L-1000N	L-2000N	L-4000	L-6000	L-8000	L-10000	L-15000
Specs.	LM-250N	LM-500N	LM-1000N	LM-2000N	—	—	—	—	—
Max. pressure MPa	58.8	58.8	58.8	58.8	49.0	49.0	49.0	49.0	49.0
Max. torque kN-m	2.45	4.90	9.80	19.60	39.20	58.80	78.40	98.00	147.00
Driving lever (R) mm	80	108	115	135	225	291	342	430	631
Reaction lever (L) mm	202	206	219	245	452	499	545	600	788
Spring retainer (φD) mm	63	72	89	107	133	151	166	194	249
Oscillating angle (θ°)	38°	27°	25°	21°	30°	24°	21°	19°	17°
ℓ 1 mm	19.5	25	29	33	41	45.5	48.5	53	61.5
ℓ 2 mm	53.5	60	68	78	89	98.5	106.5	116	126.5
R1 mm	33	39	47.5	57	70	77.5	85	98	127.5
Body Weight (kg)	Auto type	6	8	12	18	42	55	70	90
	Manual type	5	7	10	17	—	—	—	—



No.	Description
1	Driving lever
2	Reaction lever
3	Cylinder
4	Ratchet
5	Ratchet Spring
6	Spring retainer
7	Pin
8	Snapping
9	Cap screw
10	Metal washer
11	Drive socket (option)
12	Auto shuttle valve
13	High press quick coupler
14	Low press quick coupler
15	Reset button
16	Handle

※ Weight does not include sockets.

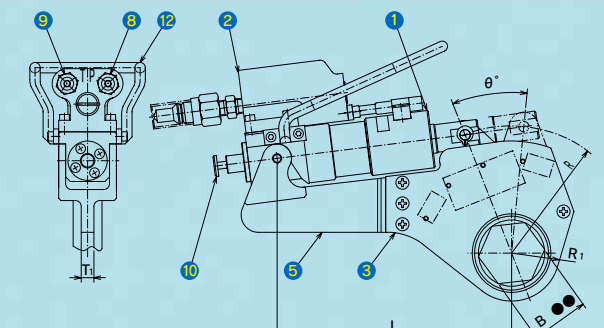
※ Above photograph and drawing shows L-N type.

# Center-hole type N-series (hydraulic)

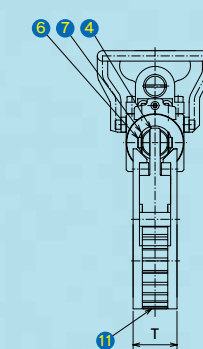


- Low profile ratchet mechanism
- Auto reciprocating mechanism
- Very easy torque presetting
- Auto stopping mechanism
- Center-hole type mechanism
- Continuous tightening
- Remote control operation

"CHN" series low profile wrenches are of center-hole type to fit directly onto nuts and are ideal for limited clearance applications or torquing nuts on long protruding studs, where other series wrenches can not access to. Auto shuttle valves are mounted on the wrenches, permitting automatic and continuous tightening. Another feature of this series is its capability to use interchangeable hex. Spacer sockets to tighten other sized bolts.



Specs.	Model	L-250CHNA	L-250CHNB	L-500CHNA	L-500CHNB	L-1000CHNA	L-1000CHNB	L-2000CHNA	L-2000CHNB
Max. pressure MPa		45.1	45.1	51.0	51.0	47.1	42.2	47.1	45.1
Max. torque kN-m		2.45	2.45	4.90	4.90	9.80	9.80	19.60	19.60
parallel face size (B●●) mm		B32~50	B50.1~65	B41~55	B55.1~75	B55~75	B75.1~95	B65~95	B95.1~115
Oscillating angle (θ°)		27°	27°	22°	22°	19°	16°	16°	14°
Driving lever (R) mm		110	110	133	133	150	170	175	195
R1 (MAX) mm		41.5	50	47	59	60	72	74	86
Reaction arm thickness (T) mm		38	38	48	48	60	60	72	76
Reaction lever (L) mm		203	203	214	217	235	248	254	270
Reaction lever thickness (T1) mm		11	11	20	20	23	23	28	28
Body Weight kg		7	7	10	11	15	18	24	28



No.	Description
1	Cylinder
2	Auto shuttle valve
3	Reaction arm Assy
4	Driving lever
5	Reaction lever
6	Pin
7	Snapping
8	High press quick coupler
9	Low press quick coupler
10	Reset button
11	Ratchet socket
12	Handle

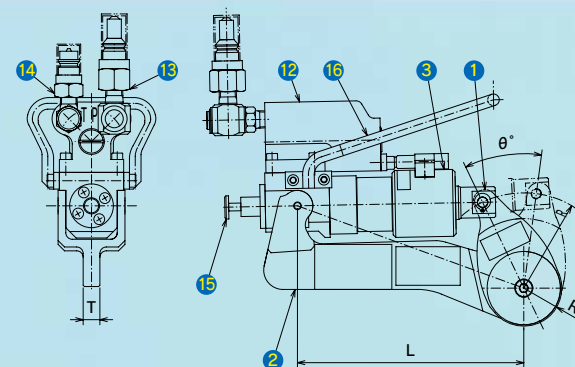
※ Other larger wrenches will be available on request.

# F-SERIES (hydraulic)

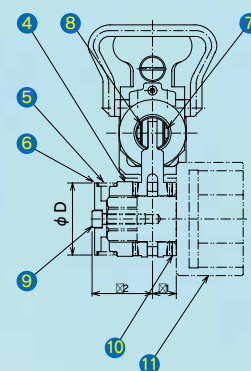


- Auto reciprocating mechanism
- Two-plane ratchet mechanism
- Remote control operation
- Very easy torque presetting and continuous tightening
- No vibration & no noise

These "F" series wrenches are new version of the "N" series, featuring more compactness and lightweight. Auto shuttle valves : are also : mounted, permitting automatic and continuous tightening. They can be also used with standard air impact sockets in general applications. Swivel hose joints on this series wrench allow easier positioning in almost any direction.



Specs.	Model	L-170F	L-250F	L-500F	L-1000F	L-2000F	L-4000F
Max. pressure	MPa	47.5	59.8	73.5	73.5	73.5	73.5
Max. torque	kN-m	1.67	2.45	4.90	9.80	19.60	39.20
Driving lever (R)	mm	64	74	85	100	130	181
Reaction lever (L)	mm	177.5	176	193	203	223	265
Spring retainer (φ D)	mm	49	56	68	83	103	130
Oscillating angle (θ°)		39°	33°	32°	28°	23°	18°
ℓ 1	mm	17	18.5	22	26	30.5	36
ℓ 2	mm	43.5	47	56.5	64	75.5	90.5
R1	mm	26.5	29.5	37.5	45.5	56	70
Body Weight	kg	5.2	5.5	7.2	11	16	28



No.	Description
1	Driving lever
2	Reaction lever
3	Cylinder
4	Ratchet
5	Spring
6	Spring retainer
7	Pin
8	Snapping
9	Cap screw
10	Metal washer
11	Drive socket (option)
12	Auto shuttle valve
13	High press quick coupler
14	Low press quick coupler
15	Reset button
16	Handle

※ Weight does not include sockets.

# ATTACHMENTS



Hydro wrench system is versatile by a choice of square drive adaptors, direct fitted box drive sockets, hex. socket head bolt drivers, reaction sockets and co-rotation stoppers, as well as ratchet sockets and interchangeable hex. spacer

sockets for center-hole wrenches. All dimensions and tolerance of the tooling are engineered for ease of set-up and use. Special sockets are available to cover such square nuts, grooved hex. or round nuts, GE Crown nuts, etc.

Such spanners, etc. have been used so far to prevent bolts from co-rotating during tightening. But it is troublesome to take out the spanner which bits the adjacent nut. A co-rotation stopper is a convenient device to overcome such problems.



co-rotation stopper

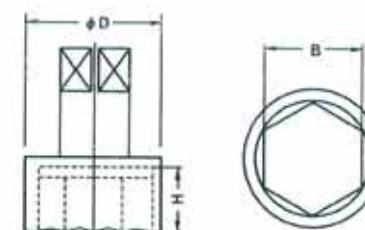
Impact socket

## ■ Dimensions of box drive sockets & air impact sockets

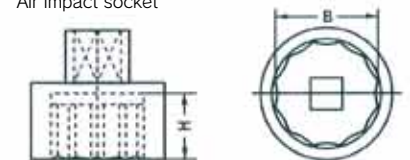
(mm)

Bolt size	IN.	1	1⅝	1¼	1⅜	1½		1⅞		1¾	1⅞		2	2¼		2½		2¾		3	3¼		3½	3¾	4	4¼		4½	4¾	5				
	M/M		30	33		36		39		42		45		48	52	56	60	64	68	72	76	80	85	90	95	100	105	110	115	120		125	130	
B		41	46	50	54	55	58	60	63	65	67	70	71	75	77	80	85	90	95	100	105	110	115	120	130	135	145	150	155	165	170	175	180	185
H		29	30	33	34	36	37	39	40	42	43	46	47	48	52	54	57	60	65	68	72	75	80	84	88	92	96	102	106	110	114	116	118	122
φD		57	69	76	79	83	87	88	96	99	104	108	108	116	119	126	132	138	147	150	158	168	177	185	190		217	226	233	245	254	259	266	269

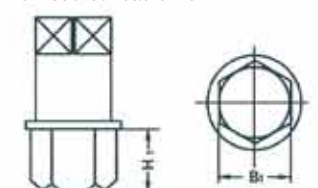
Box drive socket



Air impact socket



Hex. socket head driver



## ■ Dimensions of hex. socket head drivers

(mm)

Bolt size	M20	M22	M24	M27	M30	M33	M36	M39	M42	M45	M48	M52
B1	17		19	22	24		27		32		36	
H1	15	16	17	18	23	24	27	28	29	31	32	34



# PUMP UNIT SERIES



Nishiatsu torque wrenches can be powered by a range of electric and/or air-powered pumps. They are all designed to deliver oil so as to extend and/or retract wrench pistons automatically and continuously, while oil is always returned to pump tanks through low pressure hoses. Another important

feature of electric pumps is its capability of the equipped Digital pressure switches to simply preset the exact torque required and switch off the motor automatically when the preset torque has been reached. There is no need to operate the remote hand switch all time at both stroke and retract ends during one bolting cycle.



**PM-075ARWF** Torque control : By digital

- Electric supply : AC100V/200V · 1 $\phi$  · 0.75kW
- Low pressure : 4.9MPa
- Flow rate : 4.3L/min.
- High pressure : 78.4MPa
- Flow rate : 0.5L/min.
- Reserve oil : 5.5L
- Weight : 45kg
- Dimensions : L(456)×W(381)×H(457)mm
- Recommended use with torque wrenches
- Prototype : L-170F · L-250N/F · L-500N/F · L-1000N/F
- Center-hole type : L-250CHN · L-500CHN · L-1000CHN



**PM-150ARWF** Torque control : By digital

- Electric supply : AC200V/480V · 3 $\phi$  · 1.5kW
- Low pressure : 4.9MPa
- Flow rate : 11.0L/min.
- High pressure : 78.4MPa
- Flow rate : 1.0L/min.
- Reserve oil : 17L
- Weight : 85kg
- Dimensions : L(652)×W(413)×H(684)mm
- Recommended use with torque wrenches
- Prototype : L-2000N/F · L-4000F · L-4000 ~ L-6000
- Center-hole type : L-2000CHN



**PM-035WR** Torque control : By Analog

- Electric supply : AC100V · 1 $\phi$  · 0.35kW
- Low pressure : 1.0MPa
- Flow rate : 2.0L/min.
- High pressure : 68.6MPa
- Flow rate : 0.2L/min.
- Reserve oil : 1.0L
- Weight : 5.8kg
- Dimensions : L (322)×W (111)×H (139)mm
- Recommended use with torque wrench
- Type : L-170F



**PM-045ARWF** Torque control : By digital

- Electric supply /AC100V/AC200V · 1 $\phi$  · 0.45kW
- Low pressure : 7MPa
- Flow rate : 2.5L/min.
- High pressure : 70MPa
- Flow rate : 0.35L/min.
- Reserve oil : 3L
- Weight : 約 19kg
- Dimensions : L (212)×W (212)×H (341)mm
- Recommended use with torque wrenches
- Prototype : L-170F · L-250F (N)
- Center-hole type : L-250CHN



**APT-20150** Torque control : By relief valve

- Air supply : 0.7MPa
- Low pressure : 13MPa
- Flow rate : 257cc/cycle
- High pressure : 100MPa
- Flow rate : 18cc/cycle
- Reserve oil : 27L
- Weight : 165kg
- Dimensions : L (1,050)×W (600)×H (840)mm
- Recommended use with machinery
- BOLT TENSIONER



**APU-20100** Torque control : By relief valve

- Air supply : 0.7MPa
- Low pressure : 4.9MPa
- Flow rate : 253cc/cycle
- High pressure : 70MPa
- Flow rate : 25cc/cycle
- Reserve oil : 30L
- Weight : 116kg
- Dimensions : L (675)×W (430)×H (675)mm
- Recommended use with torque wrenches
- Prototype : L-170F ~ L-15000
- Center-hole type : L-250CHN ~ L-2000CHN



# Special type wrenches



■ **All stainless steel made Hydro wrench**  
Used in assembly of atomic fuel device at nuclear power station.



■ **High speed type wrench**  
NS system, fitted with air powered nut runner, allows high speed operation for temporary tightening and switches automatically to hydraulically bolting operation at high torque.



■ **Jumbo center-hole wrench**  
This jumbo has capacity of 15,000 kgf-m, which is designed to tighten heavy duty anchor bolts, bearing nuts, tie rod nuts of large moulding machines, etc.



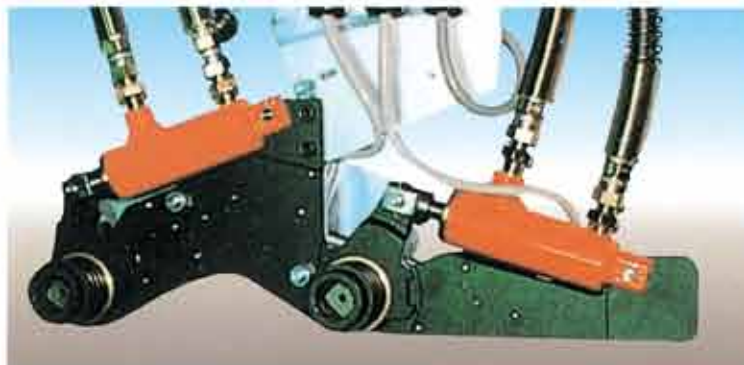
■ **Titanium alloy made wrench**  
This lightweight wrench allows easy one-hand operation to reduce fatigue and fastening time. Its weight is almost half of special steel made one.



■ **Twin cylinder center-hole wrench**  
This twin system is ideal for working in tight spots and requiring higher torque force. One ratchet mechanism is driven by two cylinders to produce double torque.



■ **Hydro wrench with an extra long reaction lever**  
The wrench body serves as the reaction point in such applications as tie rod nuts of crushers, moulding machines, etc. where distances between bolts are long.



■ **Reciprocal switch-over wrench**

Two wrenches of the same type are installed on the rail of the valve body and tighten two bolts simultaneously and in both upper and down directions. Reverse rotation is possible

■ **Two axis type wrench**  
Two "L" type wrenches are set on the common reaction lever to tighten two bolts simultaneously, without need for reaction.

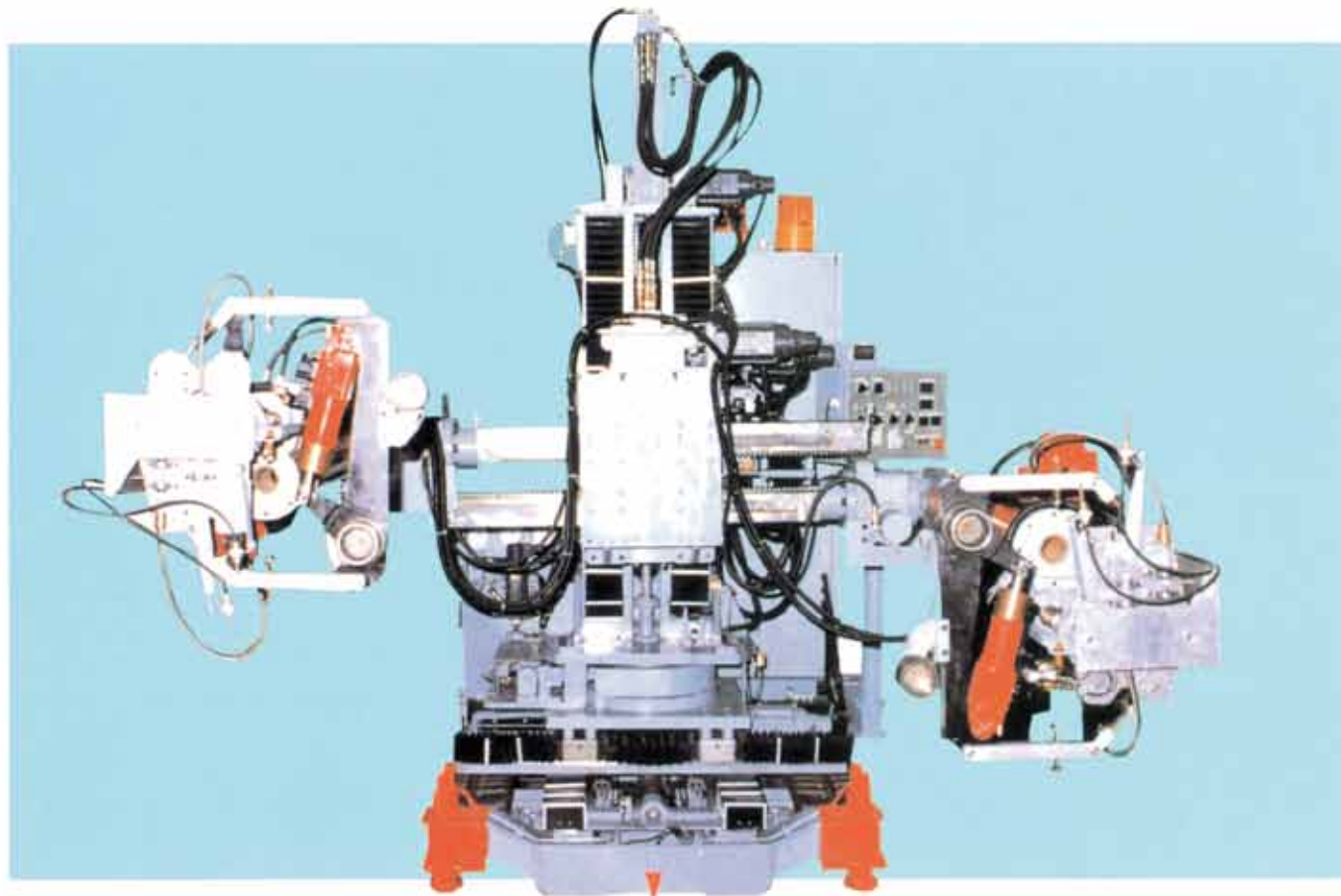


■ **Wrench with a torsion bar**  
This special design makes positioning easier for tightening bolts located in turbine casing of electric power station.





# Multi-wrenches & robots



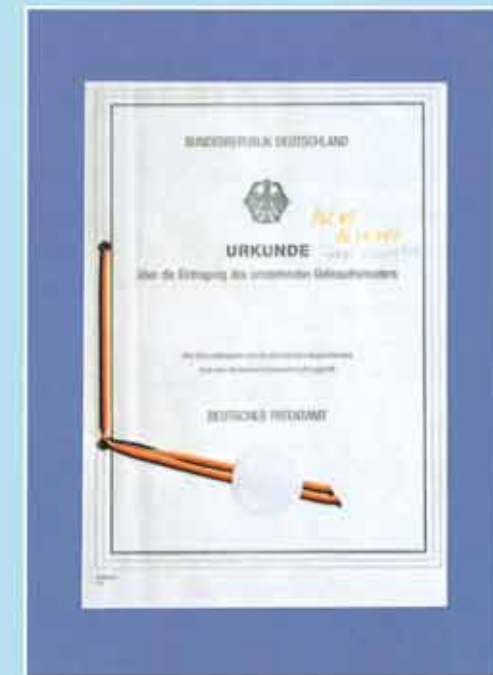
Nishiatsu has, through advanced engineering and creative design, developed a wide range of specially engineered wrenches and tools for unique applications, which lead the way in providing both technical advantages and cost savings.

Hydro wrenches are incorporated into various kinds of automatic assembly robotmachines for high performance and precision. For example, two torque wrenches are mounted on the crawler to tighten

simultaneously two bolts of heat exchangers, pressure vessels, etc. or four bolts of bulldozer diff. They are also mounted on an articulated robot to tighten freely valve/flange bolts at nuclear power stations. In all cases where max. accuracy and uniformity are important factors on tightening stud connections, the best results are obtained by using multi axis tightening. Consult our engineers for your applications.



Hydro wrenches are internationally known and patented products, which Nishiatsu can deliver you with confidence in our own capacities.



PAT.  
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