

REGINA Chain Products*

are available from

MARYLAND METRICS

P.O. Box 261 Owings Mills, MD 21117 USA

ph: (410)358-3130 (800)638-1830 fx:

(410)358-3142 (800)872-9329

web: <http://mdmetric.com>

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Request for quotation form:

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*Note: Motorcycle Chain products are not available from MARYLAND METRICS

502e

TOOL HOLDERS





DET NORSKE VERITAS QUALITY SYSTEM CERTIFICATE

Certificate No. **CERT-00105-96-AQ-MIL-SINCERT**

Si attesta che / This is to certify that

**IL SISTEMA QUALITA' DI
THE QUALITY SYSTEM OF**

REGINA INDUSTRIA S.p.A.

Via Monza, 90 - 23870 Cernusco Lombardone (LC) - Italy

Via S. Cecilia, 1 - 23824 Dervio (LC) - Italy

Via C. Cantù, 56 - 23854 Olginate (LC) - Italy

**E' CONFORME AI REQUISITI DELLA NORMATIVA
HAS BEEN FOUND TO CONFORM TO THE QUALITY SYSTEM STANDARD**

UNI EN ISO 9001: 1994 (ISO 9001: 1994)

*Questa certificazione è valida per il seguente campo applicativo.
This certificate is valid for the following product or service ranges:*

**Progettazione, produzione, assistenza pre e post vendita
di catene industriali normalizzate e speciali**

**Design, manufacture, pre- and after-sale servicing
of special and standardized industrial chains**

*Luogo e data
Place and date*

Agrate Brianza, (MI) 1999-07-21

*Certificato Iniziale emesso il:
Initial Certificate issued on:*

1993-09-14

*Questo certificato è valido fino
This certificate is valid until*

2002-07-20

*per l'Organismo di Certificazione
for the Accredited Unit*

Det Norske Veritas Italia S.r.l.

**Gaetano Trizio
Management Representative**

SINCERT

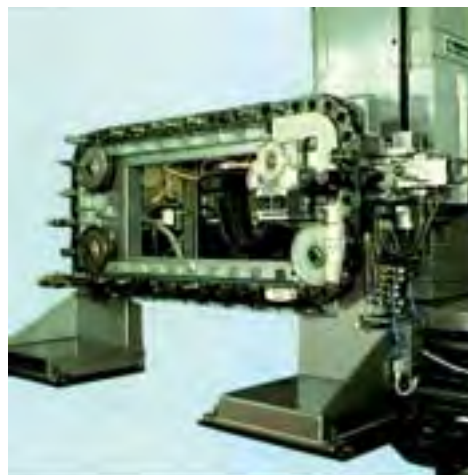
Registrazione N. 003A

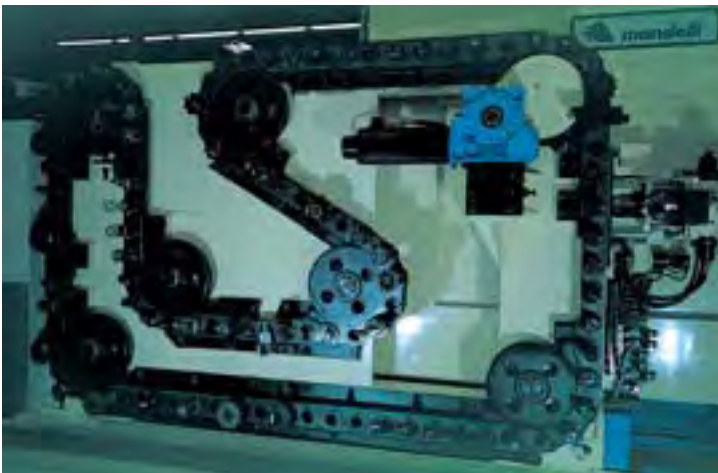
Lead Auditor: Pier Antonio Catenacci

**Leonardo Omodeo Zorini
Certification Service Manager**

Lack of fulfilment of condition as set out in the Appendix may render this certificate invalid

THC TOOL HOLDERS CHAINS





BY KIND PERMISSION OF MANDELLI GROUP (photograph)

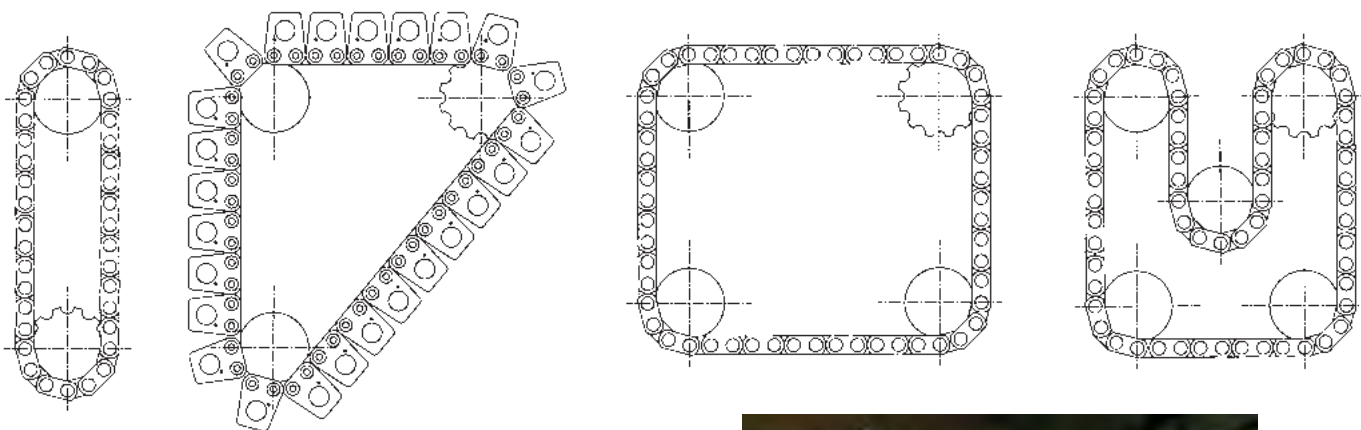


THC TOOL HOLDERS CHAINS

Regina Industria THC chains are widely employed on tool magazine storage systems in C and C machining centres equipped with automatic tool changers.

Main advantages of THC chains:

- Space saving with the same number of stored tools.
- High design flexibility in tool storage layout.
- Easy standardization of design.





THC TOOL HOLDERS CHAINS



REGINA INDUSTRIA THC

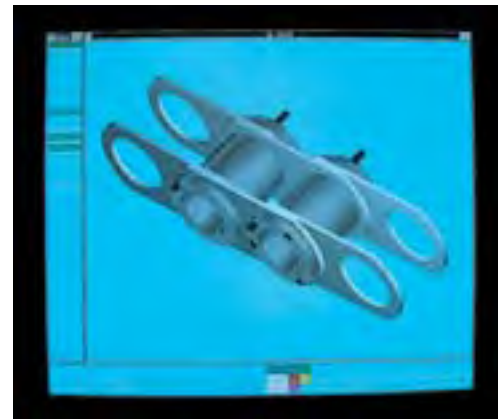
PF TYPE

Regina Industria THC chains of PF type are based and manufactured on the hollow pin chain principle. The conical holder, where the tool shank is inserted, is tapered in the chain pin itself.



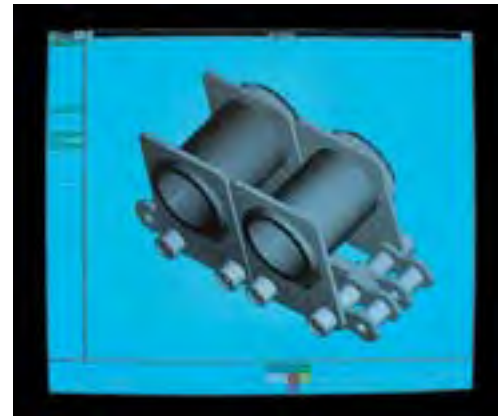
SP TYPE

Regina Industria THC chains of SP type are derived from the PF type and are manufactured with a particular locking device of the tool pot to the chain plates; this allows the angular indexing of the tool enabling the tool change operation on the same tool magazine both on the sprocket and on the straight tracks.



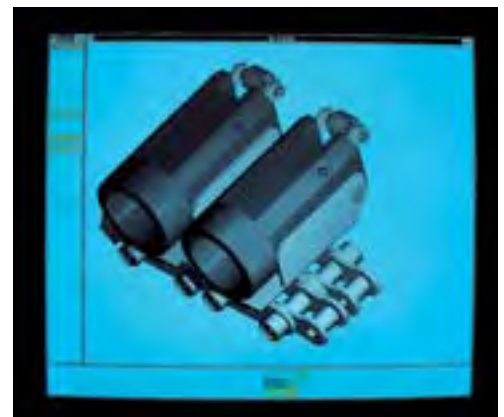
NR TYPE

Regina Industria THC chains of NR type are made of a double strand roller chain supporting the tool pots.



UR TYPE

Regina Industria THC chains of UR type are made of a base chain similar to the NR type and have the peculiarity of the tool pot rotating through 90°.





CHAINS PF - SP TYPE

Regina Industria THC chains of PF and SP type are based and manufactured on the hollow pin chain principle.

The conical holder, where the tool shank is inserted, is tapered in the chain pin itself.

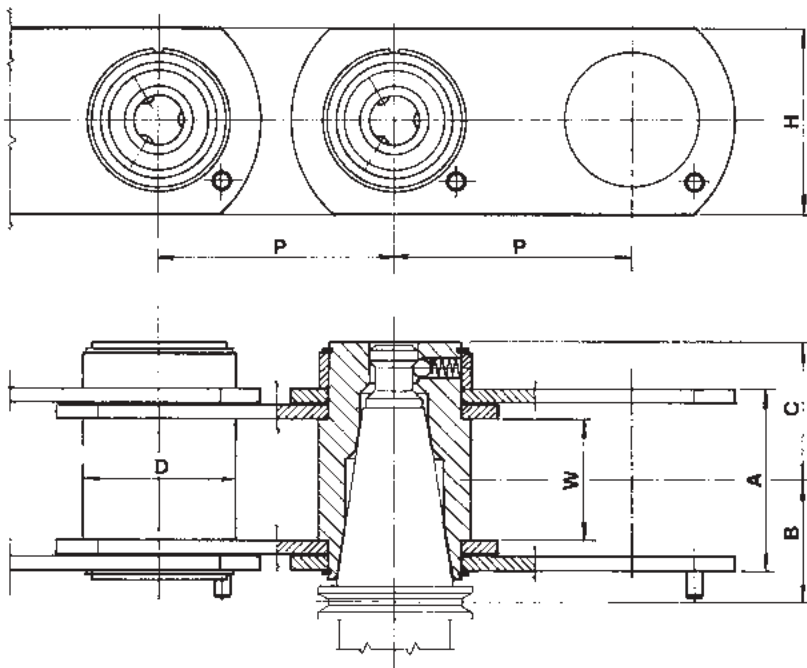
This allows the pin and the tool to be on the same axis and therefore the tool is held and moved on the pitch line of the chain with the following advantages:

Full articulation of the chain with high degree of flexibility in the chain run and consequently in the tool storage layout.

Highest compactness of the system allowing space saving and possibility of holding, in the same available space, a larger number of tools.

Utmost stability and strength particularly when supporting high weight or projecting tools.

Positioning accuracy.



CHAIN	SHANK ISO N°	P	W	D	H	A	*B	*C	EXTRACTING FORCE
		mm	mm	mm	mm	mm	mm	mm	N
PF40-1	40	90,00	45,00	60,00	80	69,50	51,00	56	250 - 350
PF50-1	50	120,00	65,00	88,00	110	98,00	69,20	80	350 - 450
PF50-4	50	130,00	65,00	88,00	110	98,00	69,20	80	350 - 450
PF50-2	50	140,00	65,00	88,00	110	98,00	69,20	80	350 - 450
PF50-7	50	145,00	65,00	88,00	110	98,00	69,20	80	350 - 450
PF50-3	50	160,00	65,00	88,00	110	98,00	69,20	80	350 - 450
SP50	50	130,00	80,00	90,00	120	105,00	76,40	80	350 - 450

* Sizes for pull rod ISO 7388/2 type A - DIN 69872 - UNI 8487A



CHAINS PF - SP TYPE CHARACTERISTICS AND OPTIONAL DEVICES

PITCH

On request it is possible to supply chains with different pitches from the ones shown in the table.

CONICAL SHANK

In addition to the chains (considered as standard) for shanks No. .40 and 50 (according to ISO 7388/1 - DIN 69871 - UNI 8487 rules), chains for shanks No. 30, 45, 60 are also available on request.

PULL ROD

The standard tool retaining system is for the pull rod according to ISO 7388/2 type A - DIN 69872 - UNI 8487 type A rules. Retaining systems for pull rods according to ISO type B, MAS, ANSI, CAT rules and for special pull rods are also available on request.

TOOL EXTRACTION FORCE

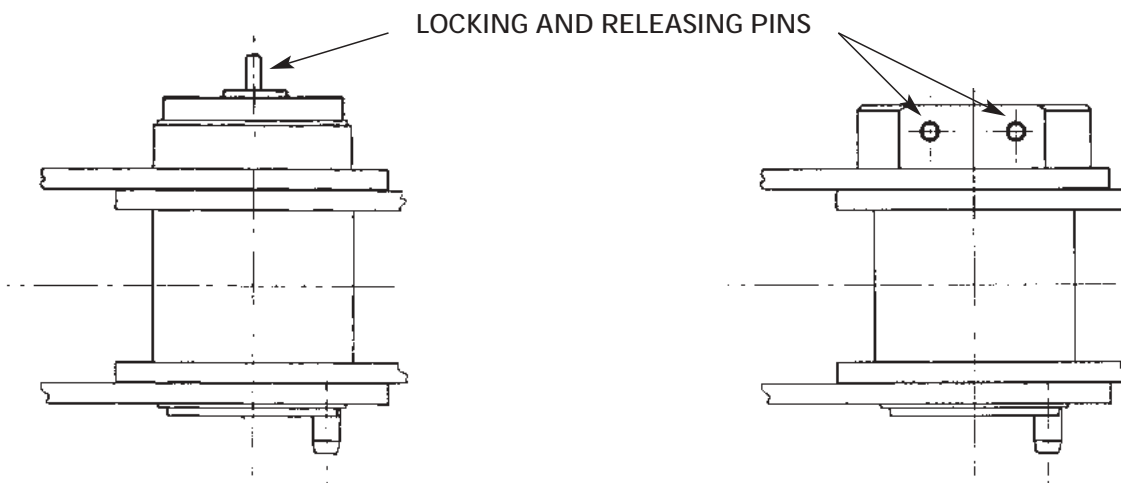
In addition to the standard extraction loads of the tool as shown in the table, it is possible to supply chains with different loads according to particular customer needs.

SAFETY DEVICE TO PREVENT FALLING OUT OF THE TOOL

On request tool pots can be supplied with safety devices for the tool locking. In this case the tool extraction is possible only by releasing a safety device pin.

Safety devices are available with the pin releasing both in parallel and perpendicular to the tool axis.

This last safety device is particularly suitable for tools of high weight and big dimensions.





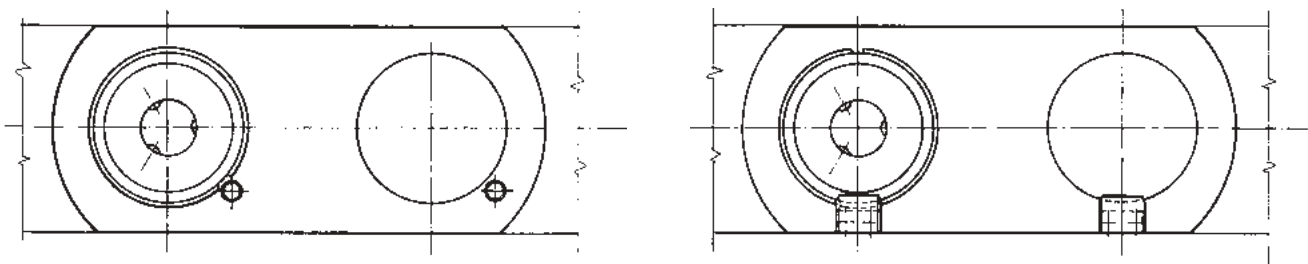
CHAINS PF-SP TYPE

CHARACTERISTICS AND OPTIONAL DEVICES

TOOL INDEXING

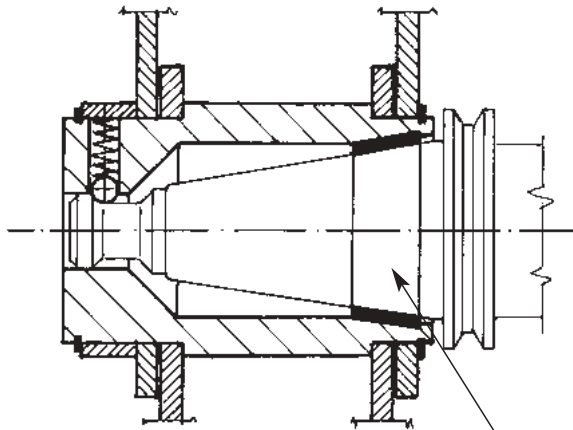
For the angular tool indexing, in addition to the stay pin device it is available also the one with key.

The angular positioning of the two devices can be changed according to the tool storage layout.



FIT OF TOOL SHANK AND POT

On request the conical tool pot can be fitted with a plastic sleeve having high wear resistance in order to prevent contact metal - metal.



SLEEVE IN PLASTIC MATERIAL

SPROCKETS

On request special manufactured sprockets are supplied for all types of chain.

For chain calculation and technical support please contact our technical office.



CHAINS NR TYPE

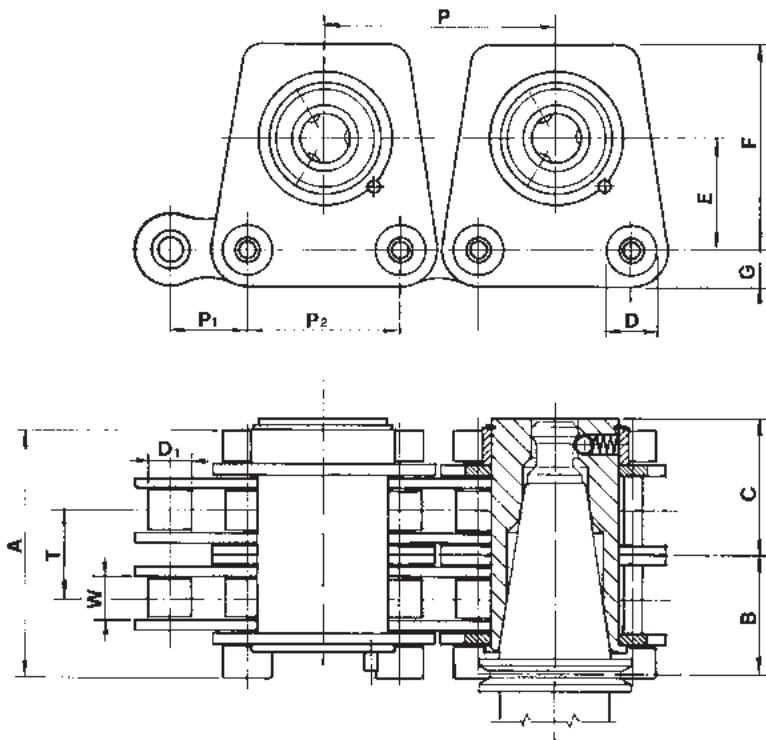
Regina Industria THC chains of NR type are made of a double strand roller chain supporting the tool holders and depending on the distance between the tool places, the chain links can have the same pitch or alternatively single and double pitch.

The tool pots are placed on the chain and supported by special outer plates; consequently these chains can articulate in one way only.

Outboard rollers, assembled on the pin extension, guide the chain lowering the coefficient of friction on long horizontal tracks.

Said rollers can also support very well both the chain and tools weight and prevent longer tools from tilting.

For optional devices please refer to pages 9 and 10.



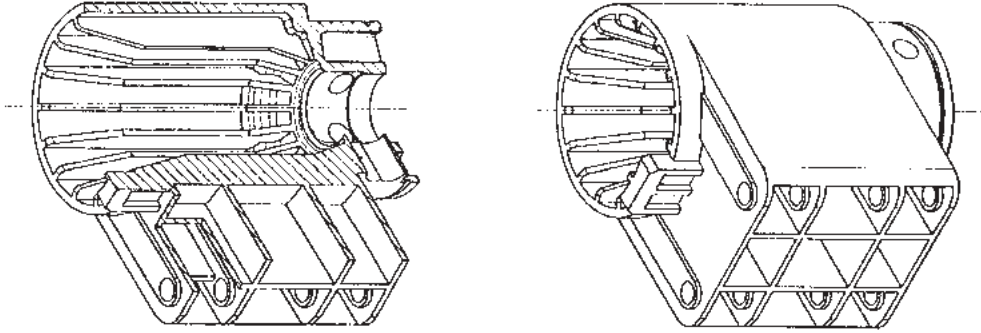
CHAIN	SHANK ISO N°	P	P ₁	P ₂	W	D ₁	D	T	A	*B	*C	E	F	G	EXTRACTING FORCE N
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
NR40-1	40	95,25	31,75	63,50	19,05	19,05	22,22	35,80	101,50	51	56	53	93	15	250 - 350
NR40-2	40	127,00	63,50	63,50	19,05	19,05	22,22	35,80	101,50	51	56	53	93	15	250 - 350
NR50-1	50	114,30	38,10	76,20	25,40	22,22	25,40	49,20	131	69,20	80	80	135	18	350 - 450
NR50-2	50	152,40	76,20	76,20	25,40	22,22	25,40	49,20	131	69,20	80	80	135	18	350 - 450
NR50-3	50	133,35	44,45	88,90	25,40	25,40	25,40	48,90	131	69,20	80	80	135	21	350 - 450
NR50-4	50	177,80	88,90	88,90	25,40	25,40	25,40	48,90	131	69,20	80	80	135	21	350 - 450

* Sizes for pull rod ISO 7388/2 type A - DIN 69872 - UNI 8487A



CHAINS NR TYPE

Some of these chains are manufactured in a special version with the whole tool holder made of high resistant plastic material in order to meet particular needs of lightness.





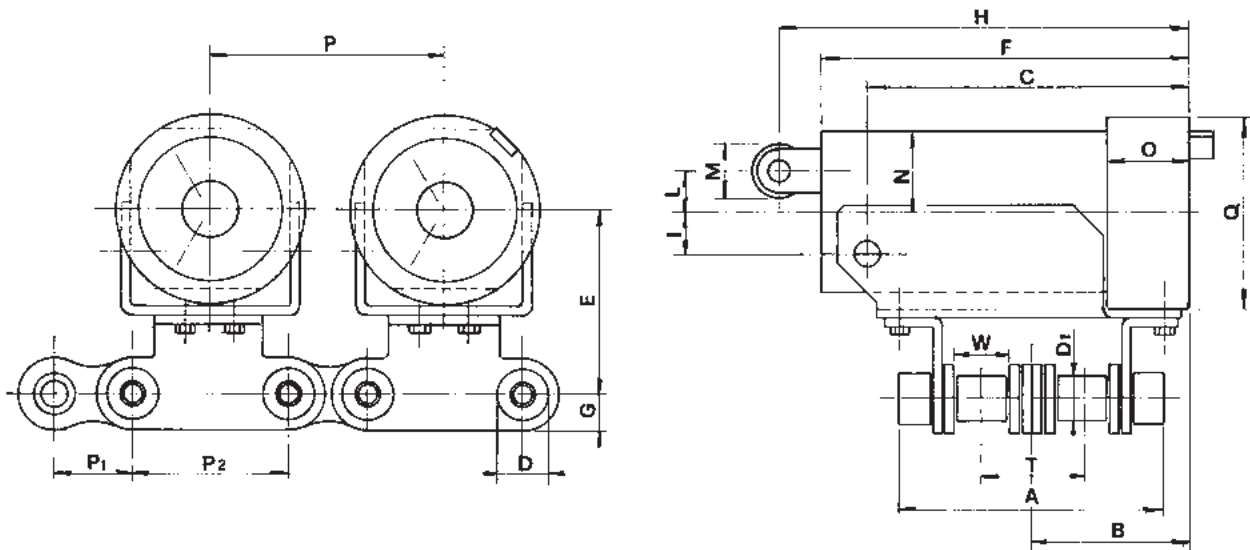
CHAINS UR TYPE

Regina Industria THC chain of UR type allow the tool pot to rotate through 90°, making easy the tool change operation particularly in vertical machining centres equipped with horizontal tool magazine.

The chains supporting the rotating system and the tool pot are of the same type as the ones used for the NR type with an additional spacing roller between the two strands of the double chain to give further support to the outside rollers.

On request the rotating system can be supplied with a locking device to prevent the rotation except the tool change position. In such a case, in addition to the actuator for the tool pot rotation, one more actuator is needed to release the locking device. The tool pot can be supplied both in metallic and high resistant plastic material.

For optional devices please refer to pages 9 and 10.



CHAIN	SHANK ISO N°	P	P ₁	P ₂	W	D ₁	D	T	A	B	C	E	F	G	H	I	L	M	N	O	Q	EXTRACTING FORCE N
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
UR40-1	40	95,25	31,75	63,50	19,05	19,05	22,22	39,35	108,50	50	120	60	134	15	156	18	17	26	28	30	65	300 - 400
UR40-2	40	127,00	63,50	63,50	19,05	19,05	22,22	39,35	108,50	50	120	60	134	15	156	18	17	26	28	30	65	300 - 400
UR50-1	50	114,30	38,10	76,20	25,40	22,22	25,40	49,20	131	78,5	160	90	180	18	200	20	20	26	40	40	95	550 - 650
UR50-2	50	152,40	76,20	76,20	25,40	22,22	25,40	49,20	131	78,5	160	90	180	18	200	20	20	26	40	40	95	550 - 650



USE OF THE TOOL HOLDERS CHAINS

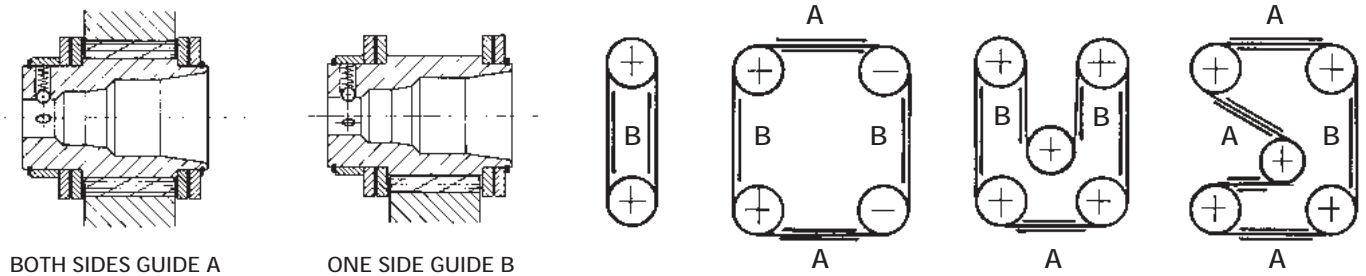
TOOLS PICKING UP POSITION

The best position to pick up the tools is at the drive sprockets, since this allows the best positioning accuracy but it's also usual to pick them up along the straight tracks between the various sprockets provided that in this area the chain is well guided and positioned.

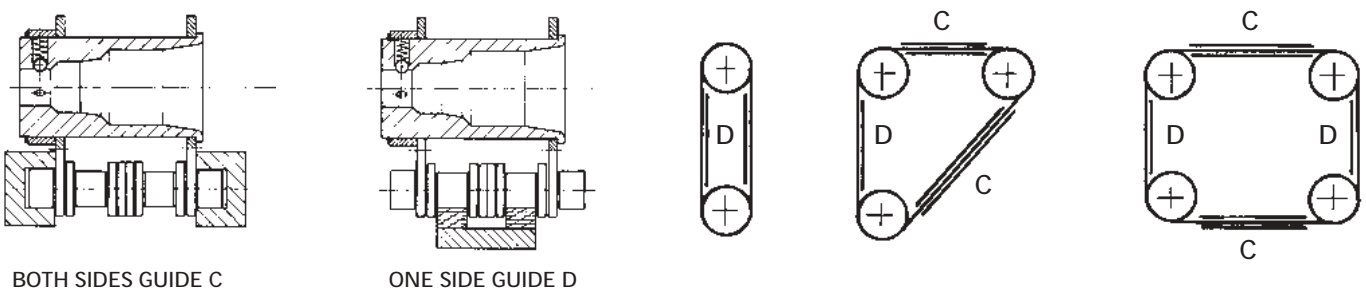
GUIDES

The tool holder chains must be well guided along the straight tracks between the various sprockets to avoid the possibility of perpendicular motion as to the travel direction. The guide system must be particularly efficient along the horizontal and inclined tracks where the chain and tools weight as well as the tilting moment caused by the tool projection is discharged almost completely on the guides.

CHAINS PF - SP TYPE



CHAINS NR - UR TYPE





USE OF TOOL HOLDERS CHAINS

CHAIN TENSIONING

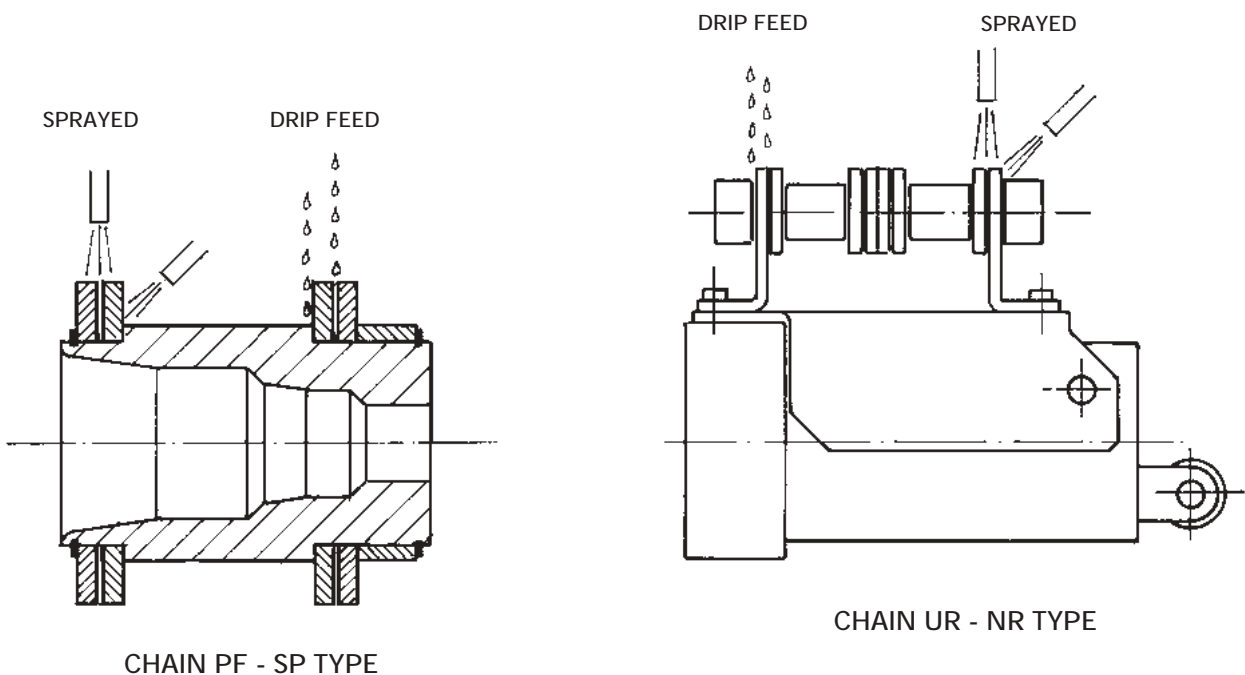
At least one of the sprockets supporting the chain must have the possibility to be adjustable to allow both for initial chain pretensioning and the future adjustment of the chain elongation. The initial load to be applied to the chain must be sufficient to avoid vibrations and can reach the 50% of the normal working load.

LUBRICATION

As for all chains, also for the tool holders ones it is very important to keep lubricated those parts which when driving slide one to the other.

In particular lubrication is required in the articulation between chain plates and pins for the chains PF and SP type and between pins, bushings and rollers for the chains NR and UR type.

The lubrication can be applied automatically (in preference) or manually, using general purpose oils for machines of good quality and with viscosity SAE 30-40; the frequency of lubrication must be such as to avoid that the moving surfaces in contact remain without lubrication; as general rule a well made lubrication every 100-150 working hours should be enough.





REGINA industria S.p.A.

TOOL HOLDERS CHAINS APPLICATION

DATE

COMPANY

ADDRESS

MANUFACTURED MACHINES

TOOLS MAGAZINE STORAGE SYSTEM PRESENTLY USED

TOOLS MAGAZINE TO BE MADE

(PLEASE SEE THE ATTACHED SHEET FOR THE LAY-OUT)

TOOL SHANK _____

PULL ROD _____

MAX. TOOL WEIGHT _____

TILTING MOMENT AS TO COLLAR _____

TOOL AXIS POSITION (VERTICAL/HORIZONTAL) _____

REQUIRED LOCKING DEVICE (ONLY SPRINGS/WITH SAFETY PIN) _____

MAX. TOOL DIAMETER _____

DISTANCE BETWEEN TOOLS _____

TOTAL NUMBER OF TOOLS _____

TOOL INDEXING DEVICE (STAY PIN OR KEY) _____

TOOL INDEXING POSITION _____

CHAIN SPEED _____

DRIVE SPROCKET (TEETH NO.) _____

IDLER WHEELS (NO. OF PCS) _____

ADDITIONAL INFORMATION _____



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Companies of the Regina Group

S.I.C.C. Regina S.p.A.	Holding Milano - Italy
Regina Industria S.p.A	Head office: Cernusco Lombardone (Como) Italy Plants: Olginate (Como) Italy Dervio (Como) Italy
Regina International	Head office: Amsterdam - Holland Branches: Blackburn - United Kingdom - TEL. 254/661116 FAX 254/59456 Münich - West Germany - TEL. 89/604771 FAX 89/6015860
Regina Industrie Sarl	Fleury Les Aubrais (Loiret) - France - TEL. 38/836363 FAX 38/836413
Regina U.S.A. Inc.	Waukesha, WI - U.S.A. - TEL. 414/521/1998 FAX 414/521/1790
Polimecanica	Buenos Aires - Argentina - TEL 1/7666821 FAX 1/7633133
Regina Sud S.p.A.	Latina - Italy
Regina Dervio S.p.A.	Dervio (Como) Italy

Affiliated Companies

Regina Warner S.p.A..	Cernusco Lombardone (Como) Italy
Industrie Meccaniche Pasotti S.p.A..	Pompiano (Brescia) Italy
O.B.M. S.p.A.	Vimercate (Milano) Italy



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