

Pliers ABC

Technical Basics

TIP: page 2 with symbols and cutting capacities. Open out the flap when working with the cataloque



Cutting Pliers for cutting or nipping (Diagonal, Center and End Cutters, Carpenters' Pincers, etc.)

half-round jaws

round jaws



Gripping Pliers (Flat, Long-Nose and Water Pump Pliers, etc.)

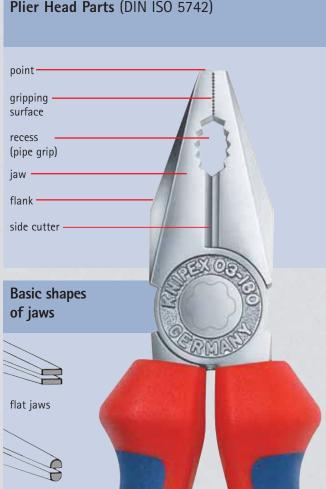


Combined Pliers which can be used for both cutting and for gripping (Combination Pliers, Stork Beak and Radio Pliers, etc.)



Special Pliers for special applications, such as for notching or punching different types of material (Sheet Metal Nibbler, Tile Nibbling Pincer,

Plier Head Parts (DIN ISO 5742)



Rivet Designs

The pliers joint is formed in a number of different ways:

Forged-on joint axis:

The rivet is part of one handle of the pliers (forged out of just one piece)

- high level of stability for heaviest duty
- long service life



Joint with inserted rivet:

A proved, sturdy and precise rivet connection for all standard pliers



Screwed joint:

for particularly demanding requirements in terms of precision and smooth operation, e.g. in circlip pliers and cable cutters (even the finest multistranded conductors have to be cut cleanly)



Types of Joints

Different types of joint design include:

Lay-on joint:

The two halves of the pliers are placed on top of each other but not milled out.



Single joint:

Half thickness of each pliers handle is milled away in the joint area so that both handles can be laid into each other.



Box joint:

One handle of the pliers is slit. The other handle is pushed through this slit. This joint design can withstand a high level of load and strain because the joint bolt is supported on both sides and the pushed through handle has two side ways bearings.



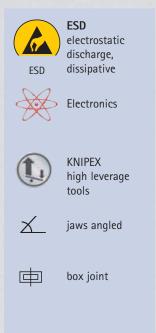
The maximum values indicated always stay for the performance limit under the most favourable cutting conditions, when the wire is placed as near as possible to the joint.

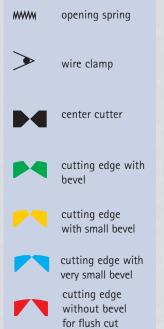
Cutting Capacities Table

			Cutting	Capacity		
Article	-No.			10		Page
	Length	Ømm	Ømm	Ø mm	Ømm	3
61 01	200	1.0 - 6.0	4.0	3.5	3.0	57
62 12	120	0.3 - 1.0	0.7			57
64 0.	115	2.0	1.0	0.6		58
64 11	115	1.4	0.8	-		58
64 12	115	2.0	0.8	0.5		58
64 22	115	0.8				58
64 32	120	1.5	1.0	0.5		58
64 42	115	1.5	1.0	0.5		58
64 52	115	1.3				58
64 62	120	0.6				58
64 72	120	1.5				58
67 0.	140	4.0	3.1	2.0	1.5	59
	160	4.0	3.4	2.5	2.0	59
	200	4.0	4.2	3.0	2.5	59
68 01	160	4.0	2.8	2.3		60
	180	4.0	3.2	2.5		60
	200	4.0	3.5	2.8		60
69 0.	130	0.4 - 2.0	1.3	1.0	0.75	60
70	110	3.0	2.0	1.2		61
	125	3.0	2.3	1.5		61
	140	4.0	2.5	1.8		61
	160	4.0	2.8	2.0		61
	180	4.0	3.0	2.5		61
71	200	6.0	5.2	4.0	3.6	62
74 0.	140		3.1	2.0	1.5	64
	160		3.4	2.5	2.0	64
	180		3.8	2.7	2.2	64
	200		4.2	3.0	2.5	64
	250		4.6	3.5	3.0	64
74 91	250	5.0	5.0	3.8	3.5	63

			Cutting	Canacity		
Article-No	2				10	Page
	Length	Ømm	Ømm	Ø mm	Ømm	raye
75 02	125	0.2 - 1.3	1.0	0.6	0.4	65
75 12	125	0.2 - 1.3	1.0	0.6	0.4	65
75 22	125	0.2 - 1.3	1.0	0.4	0.4	65
75 32	125	0.2 - 1.3	1.0	0.4	0.4	65
75 52	125	0.2 - 1.0	0.6	0.5	0.3	65
76 01	125	0.4 - 2.5	1.8	1.0	0.6	65
76 22	125	0.4 - 2.5				65
76 81	125	0.4 - 1.3	1.0	0.6		65
77 01/02	115	0.3 - 1.6	1.2	0.5		66
	130	0.3 - 2.0	1.5	0.8		66
77 21	115	0.3 - 1.3	1.0			66
	130	0.3 - 1.6	1.3			66
77 22	115	0.3 - 1.3	1.0			66
	130	0.3 - 2.0	1.5	0.5		66
77 32	115	0.3 - 1.3	1.2	0.5		66
77 42	115	0.3 - 1.3	1.0			66
	130	0.3 - 1.6	1.3			66
77 52	115	0.3 - 1.0	0.8	0.5		66
77 72	115	0.3 - 0.8				66
78 03/13		0.2 - 1.6	1.0			68
78 23	125	0.2 - 1.0	0.6			68
78 31/41	125	0.2 - 1.0				68
78 61/71	125	0.2 - 1.6	1.2			68
78 81/91	125	0.2 - 1.6	1.2	0.6		68
79 02	120	0.2 - 1.0	0.55	0.3		70
79 02	125	0.2 - 1.5	0.8	0.5		70
79 22	120	0.1 - 0.8	0.4			70
79 22	125	0.1 - 1.2	0.65	0.4		70
	125	0.2 - 1.3	0.7	0.4		70
79 42/62	125	0.1 - 1.0	0.55			70

Symbols







flat jaws

	copper + aluminium cable single-strand and multiple conductor	
	copper + aluminium cable single conductor fine-stranded	
	copper + aluminium cable single conductor solid	
(Fe)	iron	
0000 0000 0000 0000	wire rope	
••••••	ribbon cable	
	soft wire	
	medium hard wire	
•	hard wire	
	piano wire	

Cutting edges

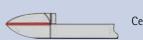
Technical Basics

Direction and Position of the Cutting edges









Center Cutters



Cutting edge shapes

DIN ISO 5742



with bevel (outside bevel)





with small bevel (outside bevel)





with very small bevel (outside bevel)





without bevel (outside bevel)

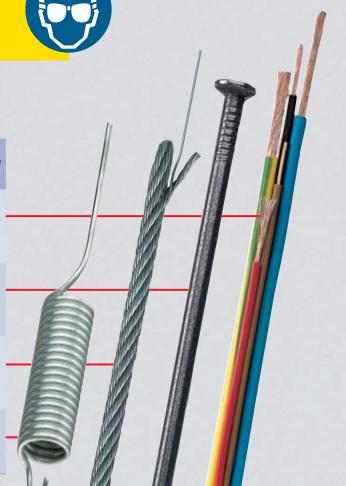


Safety instructions

- When using cutting pliers: beware of wire ends flying off. Wear protective goggles and if needed gloves.
- Each tool should only be used for its specified purpose.
- Only handles marked with the symbol 会 1000 V are insulating.

Wire classes

	Material examples	Type of wire		strength kp/mm²
•	copper, plastics	soft wire	220	22
•	nail, wire pin	medium hard wire	750	75
•	wire rope strand, steel wire	hard wire	1800	180
•	spring steel wire	piano wire	2300	230



Structure of Article Number

Finish of Pliers

Head/Handles Article-No. **Head** polished 180 Handles black atramentized Basic Model Style Finish Length **Head** polished (e.g. Combination e.g. head e.g. e.g. straight polished, Pliers) 180 mm Handles plastic coated handles black atramentized **Head** polished Handles with two-colour dual component handles Pliers chrome plated Handles plastic coated Pliers chrome plated Pliers chrome plated Handles with two-colour dual component handles Pliers chrome plated Handles insulated with two-colour dual component A 1000 V A VDE-tested Care Tip DIN EN/IEC 60900

A drop of oil on the polished surfaces and in the joint keeps your pliers in good working order and extends their service life!



Pliers chrome plated

Handles dipped plastic

insulated A 1000 V △ 🕰

VDE-tested DIN EN/IEC 60900

Contents

The full extent of the range









No.	Article	Page
01	Combination Pliers	12
08	Small Combination Pliers	12
02	High Leverage	13
	Combination Pliers	
03	Combination Pliers	14
09	Lineman's Pliers	15

No.	Article	Page			
01	Combination Pliers	12			
80	Small Combination Pliers	12			
02	High Leverage	13			
	Combination Pliers				
03	Combination Pliers	14			
09	Lineman's Pliers	15			
Stripping Tools					

No.	Article	Page
19	Jewellers' Pliers	29
20	Flat Nose Pliers	29
22	Round Nose Pliers	30
23	Flat Nose Pliers with	30
	cutting edges	
25	Snipe Nose Side Cutting	31
	Pliers	
26	Snipe Nose Side Cutting	32
	Pliers	
27	Telephone Pliers	33
28	Assembly Pliers	33
29	Telephone Pliers	34
31	Grab Pliers	34
30	Long Nose Pliers	35
32	Relay Adjusting Pliers	36
33	Duckbill Pliers	36
34	Precision Electronics	37
	Gripping Pliers	
35	Electronics Pliers	38
35	Electronics Pliers ESD	39
36	Electronics Mounting	41

No.	Article	Page
45	Special Retaining Ring	47
	Pliers	
46	External Circlip Pliers for	47
	fitting Grip Rings	
44	Internal Circlip Pliers	48
46	External Circlip Pliers	49
48	Precision Internal Circlip	50
	Pliers	
49	Precision External Circlip	51
	Pliers	





No.	Article	Page
11	Wire Strippers	17
11 92	Electronics Wire Stripper	18
12	Automatic Insulation	18
	Strippers	
12 12	Universal Insulation	19
	Strippers	
12 40	Self-Adjusting Insulation	20
	Strippers	
12 42	Multistrip 10	21
12 60	Self-Adjusting Insulation	20
	Stripper	
12 62		21
	Stripper	
12 80	FF 3	22
12 82		22
	Optics	
12 85	1-11 2	22
13	Electricians' Pliers	23
13 72		23
14	Diagonal Insulation	24
	Strippers	
15	Insulation Strippers	24
15 11	Coated-Wire Stripping	24
	Tweezers	
16 20		25
16 30		25
16 40		26
16 60		26
16 65	11 3	
16 80	Universal Stripping Tools	27

Grip Pliers



Relay Adjusting Pliers

Mechanics' Pliers

42

43

No.	Article	Page
40	Universal Grip Pliers	44
41	Grip Pliers	44
42	Welding Grip Pliers	45

Carpenters' Pincers

No.	Article	Page
50	Carpenters' Pincers	52
51	Carpenters' Pincer	52
55	Farriers` Pincer	53
56	Farriers` Pincer	53
57	Unsoling Pincer	53
58	Potters` Pincers	53

Concretors' Nippers



No.	Article F	age
99 0	Concretors' Nippers	55
99 1	High Leverage Concretors' Nippers	55



No.	Article	Page
81 03	Pipe Gripping Pliers	73
82 51	Angle Nose Battery Pliers	73
84	Cycle Pliers	73
83	Pipe Wrenches	74
87 0	KNIPEX-"Cobra" XL / XXL	76

Water Pump Pliers



Cutters

Page

93

94

95

95

96

99

100

101

11

70

92

86

95

95

98

98

98

98

98

98

98

98

98

98

98

Article

94 35 Mitre Shears

94 10 Cutter for Plastic Pipes

Vinyl Shears

Cable Shears

Cable Cutters

Cutters

No Article

Wire Rope Cutter

Bowden Cable Cutter

Wire Rope and Cable

Cutter for Ribbon Cables

Shears for KEVLAR® Fibres

Combination Shears

No.

94 15

95 02

95 03

95 05

95

95 3

95 61

Cable and Wire Rone

Insulated Tools DIN EN/IEC 60900			
金	1000 V		
	AC DISERVATION IN		
No. Article	Page		

120

121

122

123

123

125

127

126

126

127

131

132

133

133

135

136

137

137

139

140

140

140

141

01-03 Combination Pliers

Stripper

Pliers

Wire Strippers

Diagonal Insulation

Round Nose Pliers

25/26 Snipe Nose Side Cutting

Diagonal Cutters

Pliers Wrenches

Cable Shears

Cable Cutters

Screwdrivers

Nut Drivers

Cable Knives

Torque Wrench

Voltage Tester

Tool Cases

Sales Aids

Junior Hacksaw

Electricians' Gloves

Plastic Slip-On Caps

Insulating Plastic Clamp

Reversible Ratchets

Hexagon Sockets

Wrenches

Precision Tweezers

KNIPEX-"Alligator"

No.	Article	Page		
00 19	Circlip Pliers Sets	155		
00 19	Tool Pouch	154		
00 19	Tool Roll	154		
00 20	Pliers Sets	156		
00 20	Electronics Pliers Sets	157		
00 21	Tool Bag	159		
00 21	Tool Cases	161		

Electronic Pliers

No.	Article	Page
11 92	Electronics Wire Stripper	18
12 60	Self-Adjusting Insulation	20
	Stripper	
35	Electronics Pliers	38
35	Electronics Pliers ESD	39
36	Electronics Mounting	41
	Pliers	
62	Electronics Oblique	57
	Cutting Nipper	
64	Electronics End Cutting	58
	Nippers / ESD	
75	Electronics Diagonal	65
	Cutters	
76	Electro-Mechanics'	65
	Diagonal Cutters	
77	Electronics Diagonal	66
	Cutters / ESD	
78	Electronics Super-Knips /	68
78	ESD	69
79	Precision Electronics Side	70
	Cutters / ESD	71
92	Precision Tweezers / ESD	88
94 15	Cutter for Ribbon Cables	93
00 20	Electronics Pliers Sets	157

No. Article Page 85 0 SmartGrip 75 Pliers Wrenches 77 KNIPEX-"Cobra" 78 KNIPEX-"Cobra..matic" 79 87 41 Multiple Slip Joint Spanner 79 87 51 KNIPEX-"Cobra" ES KNIPEX-"Alligator" 81 Water Pump Pliers 82 89 0 Small Water Pump Pliers

Special Pliers



No.	Article	Page
90 25	Pipe Cutter	83
90 4	Punch Lock Riveters	84
90 55	Sheet Metal Nibbler	84
90 61	Notching Pliers	85
90 71	Revolving Punch Pliers	85
91 00	Tile Nibbling Pincer	86
91 11	Tile Breaking Pincer	86
91 30	Glass Breaking Pincer	86
91 5	Glass Nibbling Pincers	87
91 6	Flat Nose Grozing Pliers	87

Tweezers

No.	Article	Page
92	Precision Tweezers / ESD	88
92	Precision Tweezers VDE	90
92	Plastic Tweezers	91
92	Cross-Over Tweezers	91

Crimping Pliers and



INO.		Article	Page
97	00	Crimp Grip Pliers	102
97	21	Crimping Pliers	102
97	32	Crimping Pliers	103
97	40	Insertion Tool for LSA-	103
		Plus and identical	
97	43	Crimp System Pliers	104
97	49	Crimp Profiles	105
97	50	Crimping Pliers for	106
		Scotchlok Connectors	
97	51	Crimping Pliers for	107
		Western Plugs	
97	52	Four-Mandrel Crimping	108
		Pliers for turned contacts	
97	52	Lever Action Crimping	109
		Pliers	
97	52	Crimping Pliers "PreciForce'	110
97	53	Self-Adjusting Crimping	111
		Pliers for End Sleeves	
97		Crimping Pliers for End	113
		Sleeves (ferrules)	
97	90	Crimp Assortments	114
97	99	Cable Connectors	117

Cable Links



4		
No.	Article	Page
00 19	Sales Displays	146

No.	Article	Page
00 19	Sales Displays	146
00 19	Test Supports	147
00 19	Sales Displays	147
00 19	Rotary Sales Stand	147
00 19	Tool Bar (Pegboard)	150
00 19	Show-Cabinets for	151
	Product Presentation	
00 19	Brochure Holder	152
00 19	Hooks for perforated board	152
00 19	Pliers Racks	153

KNIPEX – The Company



Experience

KNIPEX specializes in the development and production of high-quality pliers and is Europe's leading manufacturer of these products.

It all started back in 1882 when C. Gustav Putsch set up his own forge shop in Cronenberg (now a suburb of Wuppertal). We are an independent fourth-generation family company.



Quality for professionals

KNIPEX pliers satisfy the highest expectations in terms of performance, ergonomics and service life. Our products are designed to meet the requirements of professional users, who must be able to rely on their tools in day-to-day work.



Specialists

We concentrate our knowledge and expertise on pliers. This is the only way to justify our claim that we are the best supplier in terms of quality, innovation and efficiency. Our success is assured by 650 qualified employees and we attach the greatest importance to their basic and advanced training.

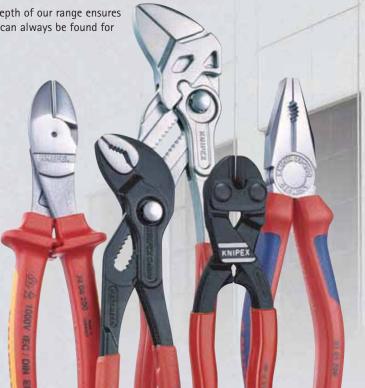
The complete range

With over a thousand separate styles and sizes KNIPEX offers a complete range of pliers for almost every application in trade and industry.

The breadth and depth of our range ensures that the best tool can always be found for each application.

Everything under one roof

In Wuppertal we have 45,000 m² (500,000 square feet) of factory space. All manufacturing operations, from forging (including making the forging die) to packaging, are done on our own premises. This method allows us to maintain stringent quality control standards and to co-ordinate all aspects of the manufacturing process.









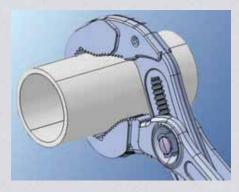
Material

In the tough and demanding world of everyday usage, KNIPEX pliers meet the challenge to the fullest satisfaction. In terms of material and construction, they are designed to function as heavy duty tools and deliver high load bearing capacity and long service life.



Tip-top technology

Innovation and high performance are not only characteristics of the tools we make but are also key elements in our production engineering. Modern state-of-the-art machinery ensures that we produce consistently high precision at the most economical cost ratio.



Innovation

KNIPEX pioneers ideas in pliers design. Again and again, KNIPEX's innovations offer future-oriented solutions and set standards for easy, effective and reliable work. For our development work we rely on an intensive sharing of experience with users. We utilize the most modern design technology and the highest efficiency testing and experimental equipment.



Partners in trade

KNIPEX pliers are supplied only through distribution. We do not deliver direct to end users. We offer our partners in trade a high level of inventory availability, extensive consulting and training and a wide variety of sales support.

KNIPEX throughout the world

KNIPEX pliers are in great demand throughout the world and we export over 60% of our production. An international network of distribution branches, agencies and importers connect us to our customers in over one hundred countries.

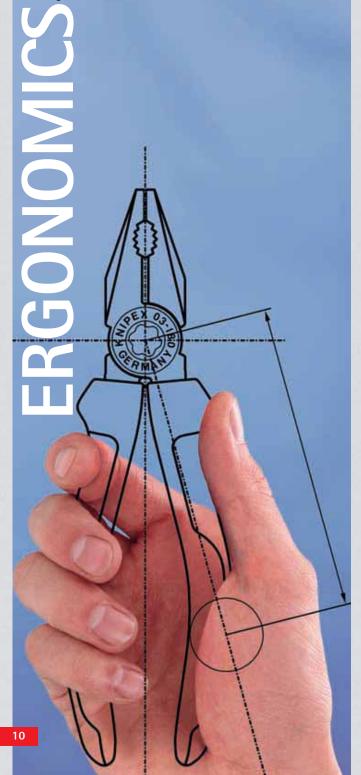
KNIPEX – Ergonomics

Practical Advantages

Ergonomics is the science of adapting technology to people in order to make work easier. Pliers, like other hand tools, should support the human hand-arm system as effectively as possible and at the same time keep strain and effort to a minimum.

When designing KNIPEX pliers, we give extensive consideration to ergonomic criteria. Our aims are to ensure that they

- require only a minimum of force in use
- assure hand and finger joints a low-stress comfortable position when exerting force
- allow good contact between the hand and handle.

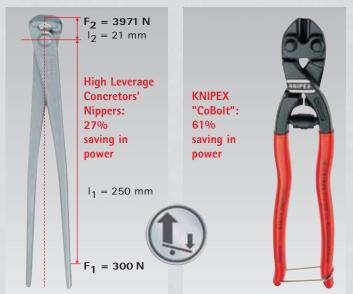




Less force exerted due to the self-locking function of the "Cobra" and "Alligator" Water Pump Pliers. As the gripping jaws automatically bite tightly into the workpiece, there is no need to squeeze the handles together. This relieves the hand muscles.

Reduction of effort

Cutting hard material in particular usually requires great manual effort but KNIPEX pliers require much less force thanks to their particularly favourable leverage ratios, which are to some extent due to unique lever designs. The benefit for the user is that they noticeably reduce the amount of force he has to apply. Particularly high leverage pliers models in this catalogue are marked with a power symbol.

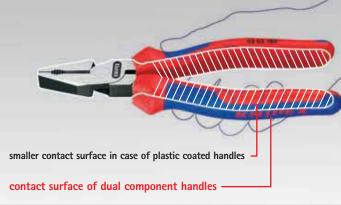


Cutting through 3-mm-diameter (1/8" dia.) binding wire using a High Leverage Concretor's Nipper requires only 300 N (30.0 kp) force as opposed to 412 N (41.2 kp) with a normal Concretor's Nipper of the same length.

Cutting through 2-mm-diameter (1/16" dia.) piano wire using the KNIPEX "CoBolt" requires only 192 N (19.2 kp) force as opposed to 499 N (49.9 kp) with a High Leverage Diagonal Cutter of the same length.



A particularly advantageous solution for favourable hand positioning is offered by the Ratchet Action Cable Cutter Art No. 95 31 with a two-stage mechanism. Depending on the required hand force, a lower (one-stage mode) or higher (two-stage model) handle distance can be selected.



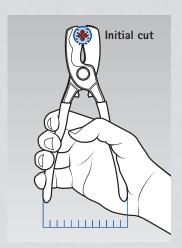
The contact surfaces in pliers with two-colour dual component handles are more than twice as large as pliers with plastic coated handles. The force is distributed to across larger surface – this reduces the pressure correspondingly.

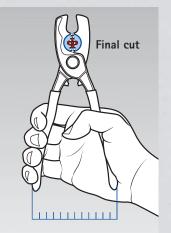
Gentle on the wrist

A lot of KNIPEX pliers are available with various pliers head shapes and positions. This means that the pliers can be adapted to the application and the hand held in a natural and strain-relieving position. Also, the spacing between the handles is engineered to ensure the best possible deployment of force (too wide or too narrow a space between the handles makes it more difficult to apply the required force).

Hand-compatible handle design

The shaping and material designing of KNIPEX multi-component handles are the result of extensive studies into gripping patterns and movement flows when working with pliers. The hand force is distributed over as large a surface as possible which permits a high transfer of force and prevents pressure points forming on the hand. The handles have different zones which make allowance for the interaction between hand and handle and their different aspects: holding – sliding – guiding.





The cable shears 95 11 200 with twin cutting edge makes it possible to cut through cables of up to 20 mm in diameter. Due to the two stage cutting process, the handles always remain in an ergonomic position when force is applied, even when used on large cross-sections.



Examples of specially designed pliers heads for work in confined working areas



High Leverage Diagonal Cutter Article No. 74 with angled head



Positioning and supporting zone The shape of the upper part of the handle offers support, especially where forces take effect in a longitudinal direction.

Gripping zone

Use of softer material with a better grip where force needs to be applied and slipping prevented.

Movement zone

Use of harder material with less friction where the hand needs to move along the handle

01 Combination Pliers, Chrome Vanadium

DIN ISO 5746



- ► for heaviest duty
- with gripping zones for flat and round material, suitable for versatile use
- with cutting edges for soft, hard and piano wire
- long cutting edges for thicker cables
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- particularly wear resistant gripping jaws due to additional hardening; hardness of the gripping jaws approx. 53 HRC
- ► Chrome Vanadium electric steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Cutt	ing ca	pacitie	s	4
Length	Code	•		•				
mm	4003773-			ømm	ømm	ømm n	nm²	g
01 06 160	040729	chrome	insulated with two-colour	2.0	1.5	10.0 1	6.0	210
		plated	dual component handles					
190	040415	chrome	↑ 1000 V ♠ ✓ VDE-tested	2.5	2.0	13.0 2	5.0	300
		plated						

08 Small Combination Pliers



- compact combination pliers for professionals and hobbyists
- with gripping zones for flat and round material, suitable for versatile use
- with cutting edges for soft and hard wire
- cutting edges additionally induction hardened, cutting edge hardness approx. 60 HRC
- ➤ Vanadium steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Cutting capacities	47
Length	Code	•	•	· ① • • • • • • • • • • • • • • • • • •	
mm	4003773-			ømm ømm ømm mm²	g
08 05 110	034957	chrome	with two-colour	2.5 1.6 9.0 10.0	90
		plated	dual component handles		

02 High Leverage Combination Pliers

DIN ISO 5746



02 02 180

- ► for heaviest duty
- ➤ 35% saving in power due to new, improved lever action
- with gripping zones for flat and round material, suitable for versatile use
- with cutting edges for soft, hard and piano wire
- long cutting edges for thicker cables
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- high grade special tool steel, oil-hardened and tempered

Specia

KNIPEX High Leverage Combination Pliers with optimum position of the joint facilitate cutting as well as powerful gripping, bending and pulling.

Requires 35 % less effort

Cutting a hard wire of 2.0 mm dia. with a High Leverage Combination Plier of 180 mm length requires a handforce of only 318 N (31.8 kp) instead of 486 N (48.6 kp) with a common Combination Plier of same length.









Gripping zone for round material



Induction hardened cutting edges also suitable for piano wire

Article-No.	EAN-	Head	Handles	Cutti	ng ca	pacities	△
Length	Code	•	•	•		(i)	
mm	4003773-			ømm	ømm	ømm mm²	g
02 01 180	013174	polished	plastic coated	2.5	2.0	11.5 16.0	205
200	013181			2.8	2.2	13.0 25.0	280
225	013198			3.0	2.5	14.0 25.0	360
02 02 180	034896	polished	with two-colour	2.5	2.0	11.5 16.0	235
200	034902		dual component handles	2.8	2.2	13.0 25.0	330
225	043379			3.0	2.5	14.0 25.0	400
02 05 180	043072	chrome	with two-colour	2.5	2.0	11.5 16.0	235
200	043089	plated	dual component handles	2.8	2.2	13.0 25.0	330
225	010005			3.0	2.5	14.0 25.0	400
02 06 180	010012	chrome	insulated with two-colour	2.5	2.0	11.5 16.0	240
200	010029	plated	dual component handles	2.8	2.2	13.0 25.0	335
225	010036		A 1000 V A VDE-tested	3.0	2.5	14.0 25.0	405
02 07 200	022299	chrome	plastic dipped insulated	2.8	2.2	13.0 25.0	385
225	022305	plated	★ 1000 V ♠ ► VDE-tested	3.0	2.5	14.0 25.0	490



Powerful gripping, pulling and bending thanks to high leverage

03 Combination Pliers

03 02 180









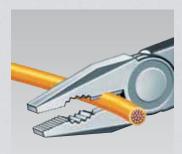
- DIN ISO 5746 ▶ with gripping zones for flat and round material, suitable for versatile use
 - with cutting edges for soft and hard wire
 - ► long cutting edges for thicker cables
 - cutting edges additionally induction hardened, cutting edge hardness approx. 60 HRC
 - ► special tool steel, oil-hardened and tempered



Gripping zone for flat material



Gripping zone for round material



Cutting edges for wire and cable

Article-No.	EAN-	Head	Handles	Cutti	ng ca	pacities	₽
Length	Code	•	1		4		
mm	4003773-			ømm	ømm	ømm mm²	g
03 00 180	015161	polished	black atramentized	3.4	2.2	12.0 16.0	210
200	015178			3.8	2.5	13.0 16.0	260
250	015185			3.8	2.5	15.0 25.0	440
03 01 140	015192	polished	plastic coated	2.8	1.8	9.0 10.0	110
160	013235			3.1	2.0	10.0 16.0	180
180	013242			3.4	2.2	12.0 16.0	220
200	013259			3.8	2.5	13.0 16.0	280
250	015222			3.8	2.5	15.0 25.0	480
03 02 160	023203	polished	with two-colour	3.1	2.0	10.0 16.0	215
180	023197		dual component handles	3.4	2.2	12.0 16.0	260
200	034940			3.8	2.5	13.0 16.0	330
03 05 140	039730	chrome	with two-colour	2.8	1.8	9.0 10.0	135
160	039518	plated	dual component handles	3.1	2.0	10.0 16.0	215
180	034933			3.4	2.2	12.0 16.0	260
200	041146			3.8	2.5	13.0 16.0	330
03 06 160	021902	chrome	insulated with two-colour	3.1	2.0	10.0 16.0	220
180	021926	plated	dual component handles	3.4	2.2	12.0 16.0	265
200	033776		★ 1000 V	3.8	2.5	13.0 16.0	335
03 07 160	015307	chrome	plastic dipped insulated	3.1	2.0	10.0 16.0	265
180	015314	plated	★ 1000 V ♠ ◆ VDE-tested	3.4	2.2	12.0 16.0	305
200	015321			3.8	2.5	13.0 16.0	380
250	015345			3.8	2.5	15.0 25.0	610

09 "Lineman's Pliers", High Leverage Combination Pliers

DIN ISO 5746



09 01 240



09 02 240



Powerful gripping zones for pulling, squeezing and leverage performance

- solid construction for heaviest impact; universally applicable
- ► high transmission ratio for easy cutting
- ➤ requires 40% less effort compared with conventional combination pliers thanks to optimised transmission ratio
- ergonomically optimised handle shape for firm contact to the hand and fatigue reducing operation
- particularly striking crosswise serrated gripping zone in the jaws - for strong gripping and pulling
- ► additional gripping zone below the articulated joint for powerful leverage and pressing performance
- with cutting edges for soft and hard wire
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- high grade special tool steel, oil-hardened and tempered



Crosswise serrated gripping zone for firm gripping and pulling on construction of railings



Gripping zone below the joint for powerful leverage



Long cutting edges for cutting flat cables

Article-No.	EAN-	Head	Handles	Cutting	g capacities	47
Length	Code					
mm	4003773-			ø mm	ø mm	g
09 01 240	064992	polished	with non-slip	4,6	3,0	465
			plastic coating			
09 02 240	065005	polished	with two-colour	4,6	3,0	490
			dual component handles			



11 Wire Strippers



- ▶ for single, multiple and fine stranded conductors with plastic or rubber insulation max.
 5.0 mm dia. or resp. 10.0 mm² cable cross section
- easy adjustment to the required diameter of solid or stranded wire with knurled screw and lock nut
- special tool steel, oil-hardened and tempered

Style 0:

▶ with opening spring

Style 1:

▶ without opening spring











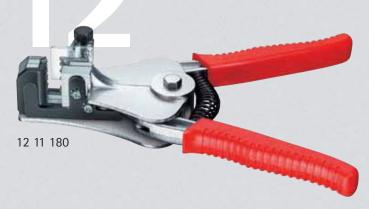
11 Electronics Wire Stripper



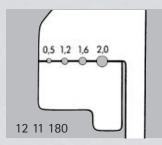
- ► for single, multiple and fine stranded cables with 0.1 up to 0.8 mm dia. with plastic or rubber insulation
- easy adjustment to the required diameter of solid or stranded wire with knurled screw and lock nut
- ▶ with opening spring
- the polish together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
- special tool steel, oil-hardened and tempered

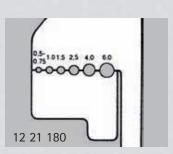
Article-No.	l	Head	Handles	Stripping capacities	7.7
Length	Code				
mm	4003773-			ø mm	g
11 92 140	016908	polished	with two-colour	0.1 - 0.8	100
			dual component h	andles	

12 Automatic Insulation Strippers



- ▶ with replaceable blades of special steel for 4 and 6 positions resp. for different wire cross sections
- leaves wire undamaged; even multi-stranded conductors are stripped gently
- during stripping, the wire is held firmly by clamping jaws
- with length stop for constant stripping length during repetitive work
- a spring leads the stripper back to the starting position
- ► strong light-metal body





Article-No.	EAN-	Head	Handles	Strippin	Stripping capacities			2,7
Length	Code	•	•					
mm	4003773-			ø mm	mm²	ø Inch	AWG	g
12 11 180	000792	nickel	plastic handles	0.5/1.2/		1/64 / 3/64		400
		plated		1.6/2.0		1/16 / 5/64		
12 21 180	000815	nickel	plastic handles		0.5-0.75/1.0/		20-18/17/	400
		plated			1.5/2.5/4.0/6.0		15/13/11/9	
12 19 180	022145	1 pair of s	pare blades for 12 11	180				
12 29 180	022152	1 pair of s	pare blades for 12 21	180				



12 Universal Insulation Strippers, particularly suitable for Teflon®



12 12 02



▶ with additional cable guide for

exact positioning of the conduc-

tor in the stripping area of the

12 12 06

Model 12 12 02:

blade



12 12 11



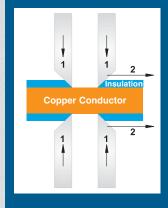
Model 12 12 11:

- ► for solar cables (weatherresistant cable for connecting photovoltaic power generation
- particularly adjusted to RADOX® insulations of solar cables

- with new stripping mechanism
- easy stripping of difficult insulating materials such as Teflon®, silicone, Radox®, Kapton® and rubber as well as multilayered insulations
- leaves wire undamaged thanks to precision-ground blade shapes; even multi-stranded conductors are stripped gently
- with length stop for constant stripping length during repetitive
- 4 replaceable blades
- smoothly operating mechanism
- compact design, lightweight construction
- high operation comfort thanks to handy shape
- ▶ with additional cable support facilitating the alignment of multilayered insulated conductors
- blades adapted to match larger wire cross-sections



Two pairs of blades (1) cut the insulation to a complete extent. Then the blade pairs move apart, and thus the insulation is removed form-fit (2). The plier opens automatically after the stripping procedure.





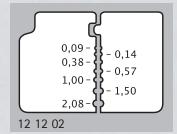
12 12 02 with cable guide and length stop

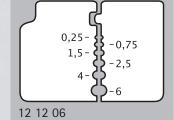


Precise cutting of the insulation to a complete extent



Positive stripping thanks to precise shape of the blades





	کار	1
	لإ	
][
	10-	
	X c	
	GP -6	
	4- (?)	
	() -2,5	
12 12 10	<u> </u>	

		$\overline{}$
	للے	
	' ከ	- 1
		- 1
	6-	- 1
	25-4	- 1
	2,5 - 🛟	- 1
	6 - 1,5	
10 10 11		

Article-No.	EAN-	Head	Handles	Stripping ca	pacities		47
	Code					Length	
	4003773-			mm²	AWG	mm	g
12 12 02	048077	nickel plated	two-colour dual	0.03 - 2.08	32 - 14	195	430
			component handles				
12 12 06	049005	nickel plated	two-colour dual component	0.14 - 6.00	26 - 10	195	430
12 12 10	049012	nickel plated	two-colour dual component	2.50 - 10.00	13 - 7	195	430
12 12 11	062998	nickel plated	two-colour dual component	1.50 - 6.00	15 - 9	195	450
12 19 02	049036	spare blades	for 12 12 02				
12 19 06	049043	spare blades	spare blades for 12 12 06				
12 19 10	049050	spare blades	spare blades for 12 12 10				
12 19 11	063001	spare blades	for 12 12 11				

Teflon® is a registered trademark of E. I. du Pont de Nemours and Company

Kapton® is a registered trademark of E. I. du Pont de Nemours and Company

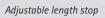
 $Radox^{\circledR}$ is a registered trademark of Huber & Suhner AG

12 Self-Adjusting Insulation Strippers





0,03 - 10,0 mm²



Length

mm

EAN-

Code

4003773-

026662

026679

026686

026693

034407

034414

034421

Article-No.

12 40 200

12 49 01

12 49 02

12 49 03

12 50 200

12 59 01

12 59 02



Precise stripping prevents damage to the conductor

Stripping capacities

0.03 - 10.0

2.5 - 16.0

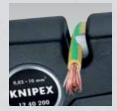
spare blades

spare blades

spare clamping jaws

spare clamping jaws

spare length stop



Wire cutter for multiple strand wire cables up to 10.0 mm²

AWG

32 - 7

13 - 5

for 12 40 200

for 12 40 200

for 12 40 200

for 12 50 200

for 12 50 200

- ► for single, multiple and fine-stranded wire cables with plastic or rubber insulation
- adjusts automatically to the respective cable cross-section, which prevents damage to the conductor
- cutting depth can be adjusted for different insulation materials
- ► with wire cutter for copper and aluminium wires, multiple strand up to 10 mm² and single strand up to 6 mm²
- smoothly operating mechanism
- easily interchangeable blades and plastic jaws
- low weight

Length stop

3.0 - 18.0

body made of tough fibreglass reinforced plastic



KNIPEX Self-Adjusting Insulation Strippers are indispensable for the electrical installation; fast and secure working in a large range of application.

Model 12 40 200:

- ► range of application: conductors 0.03 - 10.0 mm²
- ► for thin ribbon cables up to 10.0 mm width in a single pass
- ► length stop adjustable from 3.0 - 18.0 mm and easily interchangeable

Model 12 50 200:

g

200

200

➤ range of application: conductors 2.5 - 16.0 mm²

12 Self-Adjusting Insulation Stripper



- ► for single, multiple and fine-stranded wire cables with plastic or rubber insulation of 0.08 1.0 mm²
- adjusts automatically to the respective cable cross-section, which prevents damage to the conductor
- ► for thin ribbon cables in a single pass
- with wire cutter for copper and aluminium wires, multiple strand up to 1.0 mm²
- ► length stop adjustable from 2.5 7.0 mm

Articl	e-No.	EAN-	Stripping ca	apacities		Length stop	4
	Length	Code	•				
	mm	4003773-	mm²	AWG		mm	g
12 60	135	022169	0.08 - 1.0	28 - 17		2.5 - 7.0	90
12 69	135	022176	spare blades f	or 12 60 135			

- easily exchangeable blades
- smoothly operating mechanism
- low weight
- body made of tough fibreglass reinforced plastic

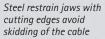


Adjusts automatically to the respective cable cross-section from 0.08 – 1.0 mm²

"Multistrip 10", Self-Adapting Universal Insulation Stripper









Precise stripping from 0.03 up to 10.0 mm²



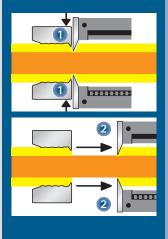
Opens automatically once the stripping operation is completed

Article-No.	EAN-	Stripping capacities		₽
Length	Code			
mm		mm²	AWG	g
12 42 195	054580	0.03 - 10.0	32 - 7	150
12 49 21	057581	spare blades block		
12 49 23	057604	spare length stop		

- ► fully automated adjustment to different cross-section depending insulation thicknesses throughout the stripping range from 0.03 – 10.0 mm²
- ▶ the so far common fine adjustment of the tool is no longer necessary due to the unique self-infeeding of the cutting depth preventing damage to the conductor
- ► the steel-made restrain jaws with integrated cutting edges very often also allow professional stripping of cables with demanding insulating materials like Teflon® and Radox®
- with wire cutter for copper and aluminium wires, multiple stranded up to 10 mm² and single stranded up to 6 mm²
- smoothly operating mechanism
- easily interchangeable screw-on style blades, length stop and restrain jaws with cutting edges
- body made of tough fibreglass reinforced plastic
- ergonomic soft compound zone in the handle area for a secure grip

Special

The cutting edges at the steel restrain jaws (1) firmly restrain the insulated cable and avoid skidding. The stripping blades (2) cut to the correct depth and remove the insulation cleanly without any manual adjustment.



Teflon® is a registered Trademark of E. I. du Pont de Nemours and Company

Radox® is a registered Trademark of Huber & Suhner AG

Self-Adjusting Insulation Stripper



Article-No.	EAN-	Stripping Capacities		₩
Length	Code			
mm		mm²	AWG	g
12 62 180	054573	0.2 - 6.0	24 - 10	180
12 69 21	060093	spare blades		

- compact standard tool at a favourable price for all current cable cross-sections and insulating materials
- ► for single, multiple and fine stranded cables of 0.2 up to 6.0 mm² with standard insulation
- adjusts automatically to the respective cable cross-section, which prevents damage to the conductor
- ► high operation comfort thanks to handy shape and low weight
- narrow head style for use in confined areas
- ▶ with wire cutter for copper an aluminium wires up to 2.5 mm²
- ▶ with adjustable length stop from 6.0 - 18.0 mm for constant stripping length during repetitive work
- easily exchangeable blades
- body made of tough, fibreglass reinforced plastic with ergonomic soft plastic gripping zone in the handle



Wire cutter up to 2.5 mm²



Stripping in confined areas

12 Mini Stripping Tool



12 80 100 SB

- ► for stripping thin copper conductors of 0.25 0.8 mm dia.
- ► precise stripping because of the tool's stepwise adjustment to the conductor's diameter
- ▶ with wire cutter
- adjustable length stop from 4.0 - 15.0 mm
- with locking device
- ► shock-resistant plastic body

Article-No.	EAN-	Stripping o	capacities	Δ'Δ
Length	Code			
mm	4003773-	ø mm	AWG	g
12 80 100 SE	043119	0.25 - 0.8	30 - 20	50

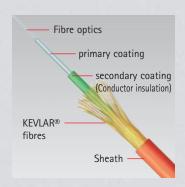
12 Wire Stripper for Fibre Optics



► to remove primary and secondary coating of fibre optics

Article-No.	EAN-	Head	Handles	Stripping capacities	47
Length	Code				
mm	4003773-			ø mm	g
12 82 130 SI	050094	burnished	with plastic handles	primary coating 0.125,	55
				secondary coating 0.25	

 $\it KEVLAR$ $^{\rm @}$ is a registered Trademark of E. I. du Pont de Nemours and Company



12 Stripping Tool for Fibre Optics



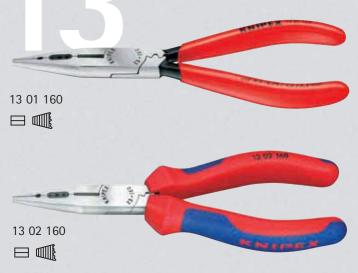
- ► to remove primary coating of fibre optics 0.125 mm dia.
- blade dia. 0.18 mm, hole for cable feeding 0.30 mm dia.
- adjustable length stop
- shock-resistant plastic body

Article-No.	EAN-	Stripping capacities	۵۵
Length	Code	•	
mm	4003773-	ømm	g
12 85 100 SB	043126	to remove primary coating of fibre optics 0.125 mm dia.	40



Removes precisely the primary coating from fibre optics

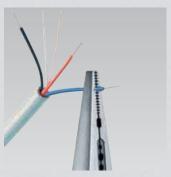
13 Electricians' Pliers



- ► the ideal plier for cable work
- ► for gripping and bending wire
- ► for cutting soft, medium and hard wire
- precision cutting edges additionally induction hardened, cutting edge hardness approx.
 60 HRC
- ► with precision stripping holes
- ► for crimping end sleeves (ferrules)
- ► high grade special tool steel, oil-hardened and tempered

Model 13 01 614:

▶ for AWG 10/12/14









Gripping

Cutting

Stripping

Crimping

Article-No.	EAN-	Head	Handles	Stripping capa	acities	7,7
Length	Code					
mm/Zoll	4003773-			mm²	AWG	g
13 01 160	010210	polished	plastic coated	0.5-0.75/1.5/2.5		110
13 01 614	040231	polished	plastic coated		10/12/14	110
13 02 160	010470	polished	with two-colour	0.5-0.75/1.5/2.5		150
			dual component handles			

13 Universal Pliers for Data Cable, STP



- ► for cutting the whole cable, the single conductor, the shield and the plastic core
- steel point at the joint for longitudinal scratching of the shield foil
- prismatic blades below the joint for dismantling the cables
- ► special tool steel, oil-hardened

Article-No.	EAN-	Head	Handles	47
Length	Code			
mm	4003773-			g
13 72 160 SB	052319	burnished	with two-colour dual component handles	80



Smooth and clean dismantling of data cables

14 Diagonal Insulation Strippers



- ► the essential plier for electrical installation work
- ► precision stripping holes for single (solid) conductors of 1.5 and 2.5 mm²
- ▶ induction hardened precision blades for soft wire up to 4.0 mm dia., cutting edge hardness approx. 60 HRC
- ► Vanadium electric steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Stripping	capacities	₽
Length	Code	•		•		
mm	4003773-			mm²	AWG	g
14 22 160	034988	polished	with two-colour	1.5 + 2.5	15 +13	205
			dual component handles			
14 26 160	040279	chrome	insulated with two-colour	1.5 + 2.5	15 + 13	210
		plated	dual component handles			
			A 1000 V A VDE-tested			



Multi-functional: cutting and stripping

15 Coated-Wire Stripping Tweezers



- ► for stripping off varnished insulation on copper wires
- ► blades for other wire diameters available as spare parts
- tweezers body made of spring steel
- ▶ plastic laminated handles

Article-No.	EAN-	Handles	Stripping capacities	2,7
Length	Code	•		
mm	4003773-		ø mm	g
15 11 120	015550	plastic laminated handles	0.6	35
spare blades			for wires:	
15 19 005	021551		0.5	
006	021568		0.6	
008	021575		0.8	
010	021582		1.0	



Precisely milled blades for clean stripping

15 Insulation Strippers with opening spring



- ► for stripping thin wires
- accurate boring to match diameter of wire, precise stripping prism, non-adjustable
- with opening spring
- special tool steel, oil-hardened and tempered



Artic	le-No.	EAN-	Style	Head	Handles	Stripping capacities	47
	Length	Code		•	•	·	
	mm	4003773-				ø mm	g
15 5	1 160	015567	WWM	polished	plastic coated	0.5	110
15 6	1 160	014843	WWM	polished	plastic coated	0.6	110
15 8	1 160	015574	WWW	polished	plastic coated	0.8	110

16 Dismantling Tools



16 20 16 SB



16 20 165 SB

Article-No.

EAN-

Handles

- for stripping all common round cables
- ► self-cocking holding lever
- with adjusting screw for cutting depth adaptation
- turnable blade for circular and longitudinal cutting
- ► spare blade inside the handle
- impact resistant plastic body made of wear-resistant polyamide
- secure grip due to soft component material on handle and holding lever to avoid slipping

Stripping capacities

Model 16 20 16 SB:

► for cables from 4.0 up to 16.0 mm dia.

Model 16 20 165 SB

- with knife and hook blade inclusive protective cap
- for cables from 8.0 up to 28.0 mm dia.

Model 16 20 28 SB:

for cables from 8.0 up to 28.0 mm dia.



Self-turning drag blade for comfortable dismantling

Length Length Code 4003773ø Inch mm mm g **16 20 16 SB** 060451 shock-resistant plastic body 4.0 - 16.0 3/16 - 5/8 130 80 16 20 165 SB 043133 shock-resistant plastic body 8.0 - 28.0 5/16 - 1 1/8 165 100 16 20 28 SB 060468 shock-resistant plastic body 8.0 - 28.0 5/16 - 1 1/8 130 80 16 29 165 043140 spare blade

16 Dismantling Tool



- ► for dismantling round PVC, rubber, silicone, PTFE cables from 6.0 - 29.0 mm dia.
- self-cocking holding lever
- with knurled nut for cutting depth adjustment
- changing from circular to longitudinal cutting by turning the tool body
- spiral cutting for longer stripping areas
- ► shock-resistant plastic body
- exchangeable blade

Article-No.	EAN-	Handles	Stripping cap	acities	47
Length	Code				
mm	4003773-		ø mm	ø Inch	g
16 30 135 SB	026907	shock-resistant plastic body	6.0 - 29.0	15/64 - 1 9/64	115
16 39 135	027317	spare blade			





Adjustable cutting depth for precise dismantling

16 Dismantling Tool



- ► for dismantling round cables exceeding 25.0 mm dia.
- removes all kinds of insulation layers
- suitable for longitudinal and circular cutting
- cutting depth can be adjusted up to 5 mm
- replaceable blade (both sides can be used)

			Cari de useuj		
Article-No.	EAN-	Handles	Stripping capacities		7,7
Length	Code				
mm	4003773-		ø mm	ø Inch	g
16 40 150	026709	fibreglass reinforced polyamide	for round cables over 25.0	1.0	210
16 49 150	026716	spare blade			

► tool body made of fibreglass reinforced polyamide



Adjustable cutting depth



Setting the tool for longitudinal cut



Longitudinal cut



Turning the tool for circular cut



Circular cut

16 Coax-Stripping Tool

EAN-

4003773-

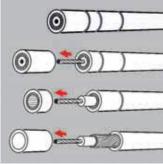


- ► for stripping Coax-cables (RG 58, RG 59 and RG 62)
- for stripping outer sheath, shield and dielectricum in one operating cycle
- ▶ with three built-in blades
- ▶ the cutting depth of each blade can be adjusted individually by means of a hexagonal key (Allen key)
- the blade spacing remains constant
- ▶ tool body made of plastic



3 stripping steps in one operation

	(
Stripping capacities ರು	
Length	0
Cabel mm g	92
RG 58, RG 59 105 65	Dismai
and RG 62	steps



Dismantling of a Coax-cable in three steps

Article-No.

16 60 05 SB 044888

16 Coax-Stripping Tool

16 60 100 SB

382



- ▶ fo all be fo als ca
- wi
- do str
- with opening spring and locking lever
- tool body made of fibreglass reinforced polyamide

data cable between 5.0 and

with opening spring and

tool body made of fibreglass reinforced polyamide

15.0 mm dia.

stripping tool

locking lever

or dismantling and stripping I common Coax-cables etween 4.8 - 7.5 mm dia. (e. g. or TV- and satellite antenna), so suitable for PVC round able 3 x 0.75 mm ² ith linear scale 5.0 - 20.0 mm ouble shell, folding back	les Company
ripping tool	Dismantlina a Coax-cable

4.8 – 7.5 mm Ø



Stripping the conductor of a Coax-cable





Stripping of UTP/STP data cables between 5.0 – 15.0 mm dia.

Arti	cle-No.	EAN-	Stripping capacities		7,7
	Length	Code			
	mm	4003773-	ø mm	ø Inch	g
16 6	30 100 SB	040811	4.8 - 7.5	5/32 - 19/64	35
			round cables 3 x 0.75 mm	1 ²	

16 Stripping Tool for Data Cable



16 65 125 SB

F	Article-No.	EAN-	Types of cables		Stripping capacities	47
	Length	Code				
	mm	4003773-		ø mm	ø Inch	g
1	16 65 125 SB	043157	UTP + STP	5.0 - 15.0	13/64 - 19/32	65

16 Universal Stripping Tools

16 80 125 SB



16 85 125 SB



- ► for dismantling and stripping all common round and damp-proof installation cables between 8.0 - 13.0 mm dia. (e. g. $3 \times 1.5 \text{ mm}^2 \text{ up to } 5 \times 2.5 \text{ mm}^2$)
- ▶ also for use in conduit and distribution boxes
- ► double shell, folding back stripping tool
- with opening spring and locking lever
- practical clip for safe transport
- tool body made of fibreglass reinforced polyamide

Model 16 85 125 SB:

- with additional blade for longitudinal cuts
- telescopic blade inside
- stripping device for cross-sections 0.2/0.3/0.8/1.5/ 2.5/4.0 mm²



Stripping of round cables between 8.0 – 13.0 mm dia.

Article-No.	EAN-	Types of cables	Stripping	capacities	Stripping capacities	2,7
Length	Code				for cross-sections	
mm	4003773-		ø mm	Ø Inch	mm²	g
16 80 125 S	B 040828	round cables	8,0 - 13,0	5/16-33/64		65
		(3 x 1,5 mm ² up to 5 x 2,5 mm ²)				
16 85 125 S	B 060444				0,2/0,3/0,8/1,5/2,5/4,0	90

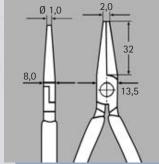


19 Jewellers Pliers, Round Nose Pliers

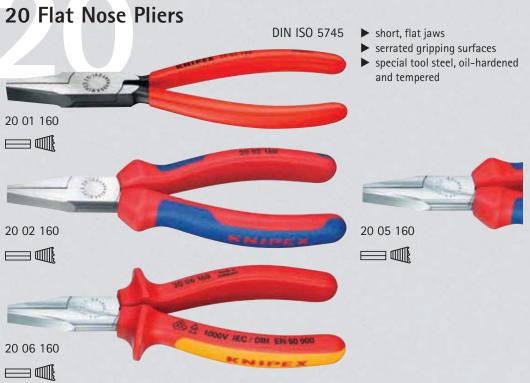


- for fine wire and jewellery work
- ► ideal for cutting and bending work, e. g. in electronics
- ► for forming wire loops
- precision ground round jaws with fine, pointed tips
- cutting edges additionally induction hardened, cutting edge hardness approx.
 60 HRC
- ➤ Vanadium steel, oil-hardened and tempered

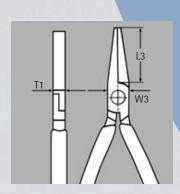
4		(



Article-No.	EAN-	Head	Handles	44
Length	Code	•		
mm	4003773-			g
19 01 130	014478	polished	plastic coated	70
19 03 130	014348	chrome plated	plastic coated	70



Article-No.	EAN-	Head	Handles	Dimer	nsions		47
Length	Code		•	L3	W3	T1	
mm	4003773-			mm	mm	mm	g
20 01 125	014447	polished	plastic coated	27.0	14.5	8.0	80
140	014454			28.0	15.5	9.5	110
160	015017			30.0	17.0	9.5	140
180	015666			35.0	19.0	10.0	190
200	015673			38.0	21.0	12.0	275
20 02 140	043386	polished	with two-colour	28.0	15.5	9.5	145
160	035008		dual component handles	30.0	17.0	9.5	170
20 05 140	042464	chrome	with two-colour	28.0	15.5	9.5	145
160	042457	plated	dual component handles	30.0	17.0	9.5	170
20 06 160	033783	chrome	insulated with two-colour	30.0	17.0	9.5	175
		plated	dual component handles				
			A 1000 V ♠ VDE-tested				



22 Round Nose Pliers

DIN ISO 5745

- ► for forming wire loops
- precision ground, short, round jaws
- ▶ smooth tips
- special tool steel, oil-hardened and tempered

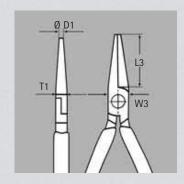








Article-No.	EAN-	Head	Handles	Dime	nsions			47
Length	Code	•	•	L3	W3	D1	T1	
mm	4003773-			mm	mm	ø mm	mm	g
22 01 125	014461	polished	plastic coated	27.0	14.5	2.0	8.0	70
140	013013			28.0	16.5	2.5	9.5	100
160	015024			30.0	18.0	3.0	9.5	140
180	015819			35.0	21.0	3.5	10.5	180
22 02 140	043430	polished	with two-colour	28.0	16.5	2.5	9.5	135
160	023173		dual component handles	30.0	18.0	3.0	9.5	165
22 05 140	042891	chrome	with two-colour	28.0	16.5	2.5	9.5	135
160	042907	plated	dual component handles	30.0	18.0	3.0	9.5	165
22 06 160	033790	chrome	insulated with two-colour	30.0	18.0	3.0	9.5	170
		plated	dual component handles 🛱 1000 V 🕸	🖒 VDE-	tested			
22 07 160	015901	chrome	plastic dipped insulated	30.0	18.0	3.0	9.5	205
		plated	★ 1000 V APP VDE-tested					



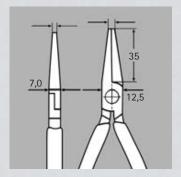
23 Flat Nose Pliers with cutting edges, Precision Mechanics Pliers



- suitable for gripping and cutting work in precision mechanics
- ► long, tapering jaws
- serrated gripping surfaces
- with cutting edges for soft wire 2.5 mm dia. and medium hard wire 1.6 mm dia.
- cutting edges additionally induction hardened, cutting edge hardness approx. 60 HRC

high grade special tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	5,7
Length	Code			
mm	4003773-			g
23 01 140	015918	polished	plastic coated	65



25 Snipe Nose Side Cutting Pliers, Radio Pliers



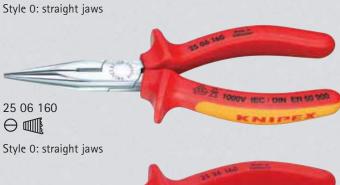
- ► suitable for gripping and cutting work in precision mechanics
- ▶ pointed, half-round jaws
- serrated gripping surfaces
- with cutting edges for medium hard and hard wire
- cutting edges additionally induction hardened, cutting edge hardness approx. 61 HRC
- high grade special tool steel, oil-hardened and tempered

Style 0:

straight jaws

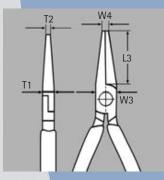
Style 1:

▶ 40° bent jaws





Style 2: 40° bent jaws



100												
Article-No.	EAN-	Style	Head	Handles	Cutting	capacities	Dime	nsion	s			7.7
Length	Code	•	•	•		4	L3	W3	T1	W4	T2	
mm	4003773-	-			ømm	ømm	mm	mm	mm	mm	mm	g
25 01 125	015932	0	polished	plastic coated	2.2	1.6	27.0	13.0	7.0	2.5	1.8	70
140	013082				2.5	1.6	42.0	15.0	8.0	2.5	2.0	90
160	013099	Λ			2.5	1.6	50.0	16.5	9.5	3.0	2.5	115
25 02 140	023159	- / /	polished	with two-colour	2.5	1.6	42.0	15.0	8.0	2.5	2.0	110
160	023166			dual component handles	2.5	1.6	50.0	16.5	9.5	3.0	2.5	145
25 03 125	015956	M	chrome	plastic coated	2.2	1.6	27.0	13.0	7.0	2.5	1.8	70
160	014492	l hi	plated		2.5	1.6	50.0	16.5	9.5	3.0	2.5	115
25 05 140	035015	()	chrome	with two-colour	2.5	1.6	42.0	15.0	8.0	2.5	2.0	110
160	022817	\ 1	plated	dual component handles	2.5	1.6	50.0	16.5	9.5	3.0	2.5	145
25 06 160	033806		chrome	insulated with two-colour	2.5	1.6	50.0	16.5	9.5	3.0	2.5	150
			plated	dual component handles								
				A 1000 V A VDE-tested								
25 21 160	015994	2	polished	plastic coated	2.5	1.6	50.0	16.5	9.5	3.0	2.5	115
25 25 160	016007		chrome	with two-colour	2.5	1.6	50.0	16.5	9.5	3.0	2.5	145
plated		plated	dual component handles									
25 26 160	052111	l hl	chrome	insulated with two-colour	2.5	1.6	50.0	16.5	9.5	3.0	2.5	150
		{7	plated	dual component handles								
		∡_40°		A 1000 V A VDE-tested								
		∆_ 4 0										

26 Chain Nose Side Cutting Pliers, Stork Beak Pliers



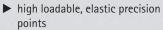






Style 2: 40° bent jaws

	Lean	le	la .	lu u	
Article-No.	EAN-	Style	Head	Handles	47
Length	Code	-			
mm	4003773-				g
26 11 200	013105		polished	plastic coated	170
26 12 200	023142	1	polished	with two-colour	200
				dual component handles	
26 13 200	016038	Λ	chrome plated	plastic coated	170
26 15 200	035022		chrome plated	with two-colour	200
				dual component handles	
26 16 200	022831	W	chrome plated	insulated with two-colour	205
		H [1]		dual component handles	
		14		A 1000 V A VDE-tested	
26 17 200	016069	\ /	chrome plated	plastic dipped insulated	225
				A 1000 V △ P VDE-tested	
26 21 200	013112		polished	plastic coated	170
26 22 200	023135	2	polished	with two-colour	200
				dual component handles	
26 23 200	016076		chrome plated	plastic coated	170
26 25 200	035039		chrome plated	with two-colour	200
		M		dual component handles	
26 26 200	022855	h	chrome plated	insulated with two-colour	205
		(7		dual componentsleeves	
		1 1		A 1000 V A VDE-tested	
26 27 200	016090	∡_ 40°	chrome plated	plastic dipped insulated	225
				A 1000 V △ CP VDE-tested	



- ▶ half-round, long jaws
- ► serrated gripping surfaces
- ► with cutting edges for medium hard wire max. dia. 3.2 mm and hard wire max. dia. 2.2 mm
- cutting edges additionally induction hardened, cutting edge hardness approx. 61 HRC
- ► Vanadium steel, oil-hardened and tempered

Style 0:

► straight jaws

Style 1:

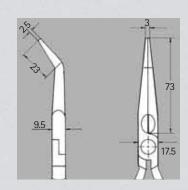
▶ 40° bent jaws



KNIPEX Snipe Nose Side Cutting Pliers (Stork Beak Pliers) are forged from Vanadium steel and carefully hardened. The slim precision tips withstand high demands, particularly bending loads.



High loadable elastic precision tips



27 Telephone Pliers, with center cutter

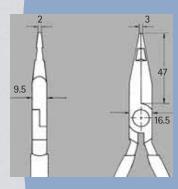


- grips and separates single wires in cable trees
- ▶ with center cutter for soft wire
- ▶ half-round jaws
- ► serrated gripping surfaces
- ► Chrome Vanadium electric steel, oil-hardened and tempered

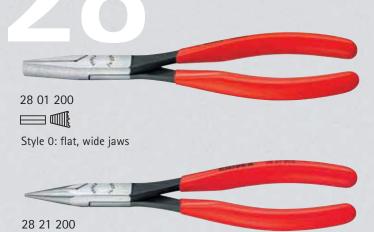




Article-No.	EAN-	Head	Handles	\$
Length	Code	·	·	
mm	4003773-			g
27 01 160	016106	polished	plastic coated	120



28 Assembly Pliers



- specially suitable for gripping adjusting and assembly work with a higher prehensile power
- serrated gripping surfaces
- special tool steel, oil-hardened and tempered

Style 0:

▶ flat, wide jaws

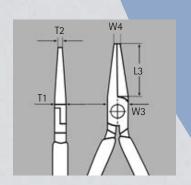
Style 2:

► half-round jaws

Style 2: half-round jaws

 Θ

Article-No.	EAN-	Style	Head	Handles	Dime	nsion	44			
Length	Code				L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	g
28 01 200	013020	0	polished	plastic coated	33.0	13.5	10.5	4.0	10.5	200
28 03 200	016144		chrome plated	plastic coated	33.0	13.5	10.5	4.0	10.5	200
28 21 200	028246	2 ⊖	polished	plastic coated	34.0	13.5	10.5	3.0	3.0	190



29 Telephone Pliers without side cutter



- ▶ gripping surfaces cross cut
- ► Chrome Vanadium electric steel, oil-hardened and tempered

Style 1:

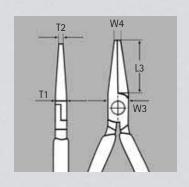
► flat, wide jaws

Style 2:

- ► half-round jaws
- extra slim, fine tips; also suitable for soldering work

Style 2: half-round jaws

Article-No.	EAN-	Style	Head	Handles	Dimensions					Δ'Δ
Length	Code				L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	g
29 11 160	016175	1	polished	plastic coated	55.0	14.0	8.0	2.5	8.5	110
29 21 160	016199		polished	plastic coated	54.0	14.0	9.0	2.0	2.0	120
		2								
29 25 160	043478	Θ	chrome	with two-colour	54.0	14.0	9.0	2.0	2.0	145
			plated	dual component handles						



31 Grab Pliers, Needle Nose Pliers



- precision pliers for very exact assembly, bending and adjusting work
- with extra long jaws: length of jaws 55.0 mm
- smooth ground gripping surfaces
- edges carefully deburred
- ► Chrome Vanadium electric steel, oil-hardened and tempered

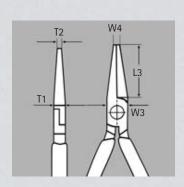
Style 1:

▶ straight jaws

Style 2:

▶ 45° bent jaws

Article-No.	EAN-	Style	Head	Handles	Dimensions			47		
Length	Code				L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	g
31 11 160	016441	1	polished	plastic coated	55.0	15.0	7.5	2.0	2.5	100
31 15 160	016465		chrome	with two-colour	55.0	15.0	7.5	2.0	2.5	120
			plated	dual component handles						
31 21 160	013075	2	polished	plastic coated	55.0	15.0	7.5	2.0	2.5	100
31 25 160	016489		chrome	with two-colour	55.0	15.0	7.5	2.0	2.5	120
		<u>⊀_</u> 45°	plated	dual component handles						



30 Long Nose Pliers, without side cutter

DIN ISO 5745

- ► heavy duty and wear resisting
- ▶ different jaw styles
- ► Chrome Vanadium electric steel, oil-hardened and tempered

Style 1:

- ▶ long, trapezoidal jaws
- serrated gripping surfaces



Style 1: long, trapezoidal jaws serrated gripping surfaces



Style 2: long, half-round jaws serrated gripping surfaces



- long, half-round jaws
- serrated gripping surfaces

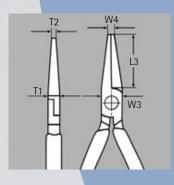


Style 3: long, round jaws smooth gripping surfaces

Style 3:

- long, round jaws
- ► smooth gripping surfaces

Article-No.	EAN-	Style	e Head Handles			ension	S			47
Length	Code		•	•	L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	g
30 11 140	013037	1	polished	plastic coated	42.0	15.0	8.0	2.5	4.0	90
160	013044				46.5	16.5	9.5	3.0	5.0	120
190	013051				50.0	18.5	8.0	3.0	7.0	140
30 13 140	016298		chrome	plastic coated	42.0	15.0	8.0	2.5	4.0	90
160	016304		plated		46.5	16.5	9.5	3.0	5.0	120
30 15 140	042914		chrome	with two-colour	42.0	15.0	8.0	2.5	4.0	110
160	035046		plated	dual component handles	46.5	16.5	9.5	3.0	5.0	150
190	001881				50.0	18.5	8.0	3.0	7.0	175
30 16 160	001904		chrome	insulated with two-colour	46.5	16.5	9.5	3.0	5.0	155
			plated	dual component handles <u>A</u> 1000 V <u>A</u> C VDE-tested						
30 21 140	016328	2	polished	plastic coated	42.0	15.0	8.0	2.5	2.0	95
160	016335				50.0	16.5	9.5	3.0	2.5	125
190	016366	Θ			50.0	18.5	8.0	3.0	2.4	145
30 23 140	016373		chr. plated	plastic coated	42.0	15.0	8.0	2.5	2.0	95
30 25 140	001980		chrome	with two-colour	42.0	15.0	8.0	2.5	2.0	115
160	035060		plated	dual component handles	50.0	16.5	9.5	3.0	2.5	155
190	043515				50.0	18.5	8.0	3.0	2.4	180
30 31 140	016397	3	polished	plastic coated	37.5	15.0	8.0	4.0	2.0	85
160	013006				41.0	16.5	9.5	5.0	2.5	110
30 33 160	016434	8	chrome pl.	plastic coated	41.0	16.5	9.5	5.0	2.5	110
30 35 140	043102		chrome	with two-colour	37.5	15.0	8.0	4.0	2.0	105
160	035084		plated	dual component handles	41.0	16.5	9.5	5.0	2.5	140
30 36 160	002123		chrome	insulated with two-colour	41.0	16.5	9.5	5.0	2.5	145
			plated	dual component handles ★ 1000 V ◆ VDE-tested						



32 Relay Adjusting Pliers



- ► for gripping components and wires of the smallest diameters and for bending contact and relay springs
- polished gripping surfacesedges carefully deburred
- Chrome Vanadium electric steel, oil-hardened and tempered

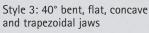
Style 1:

► flat, concave and pointed jaws

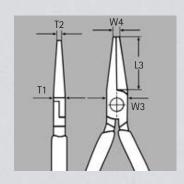
Style 2:

► flat, wide jaws

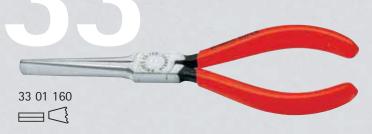
▶ 40° bent, flat, concave and trapezoidal jaws



Article-No.	EAN-	Style	Head	Handles	Dime		47			
Length	Code		•		L3	W3	T1	W4	T2	
mm	4003773-	-			mm	mm	mm	mm	mm	g
32 11 135	016496	1	polished	plastic coated	34.0	12.5	7.0	1.4	1.5	75
32 21 135	016533	2	polished	plastic coated	34.0	12.5	7.0	1.4	3.5	75
32 23 135	016557		chrome plate	d	34.0	12.5	7.0	1.4	3.5	75
32 31 135	016588	3	polished	plastic coated	32.0	12.5	7.0	1.4	3.5	75
		<u>∡40°⊟</u>								

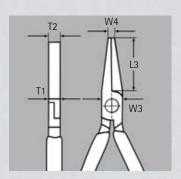


33 Duckbill Pliers



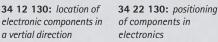
- ▶ duckbill shaped jaws 9 mm wide at the tip and tapering to 1.5 mm thickness
- smooth gripping surfaces
- Chrome Vanadium electric steel, oil-hardened and tempered

Article-No.	EAN-	- Head Handles Dimensions							Δ'Δ	
Length	Code	•	•		L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	g
33 01 160	016663	polished	plastic coated		55.0	15.0	7.5	3.0	9.0	110
33 03 160	016670	chr. plated	plastic coated		55.0	15.0	7.5	3.0	9.0	110



34 Precision Electronics Gripping Pliers, with ground screw joint







34 22 130: half-round tips for bending and forming

► the assortment for highest standard of performance and results

- precision pliers for ultra fine assembly work, e.g. in electronics and fine mechanics
- for gripping, holding and bending
- joint with screw: precise, zero-backlash operation of
- precisely finished joint surfaces for smooth, low friction movement along the complete opening range
- ► low-friction double spring for gentle and even opening
- smooth ground gripping surfaces, edges carefully deburred
- non-reflective finish
- low weight
- ergonomically shaped, two-colour dual component handles; blue/grey
- high quality ball bearing steel, forged

ESD version:

- electrically discharging version - dissipative
- two-colour dual component handles; black/grey

Style 1:

► flat, wide jaws

Style 2:

▶ half-round jaws

Style 3:

round, pointed jaws



KNIPEX

Greater contact at the ball of the thumb

34 12 130: location of

a vertial direction

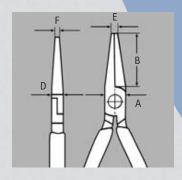
Article-No.	EAN-	Style	Dimen	sions					Δ'Δ
	Code	all pliers with	В	Α	D	Е	F	Length	
	4003773-	WWM	mm	mm	mm	mm	mm	mm	g
34 12 130	061458	1 ==	19,0	11,0	6,5	1,5	3,5	135	60
34 12 130 E	SD 061632		19,0	11,0	6,5	1,5	3,5	135	60
34 22 130	061472	2 ⊖	19,0	11,0	6,5	1,5	1,5	135	60
34 22 130 E	SD 061656		19,0	11,0	6,5	1,5	1,5	135	60
34 32 130	061496	3 8	21,0	11,0	6,5	2,0	1,0	135	60
34 32 130 E	SD 061670		21,0	11,0	6,5	2,0	1,0	135	60

In the design of KNIPEX **Electronics Pliers for gripping** and cutting ergonomic criteria have been given particular attention. The ergonomics of the twocolour dual component handles were optimised to suit the motion sequence during precision work. The shape and material chosen allow a secure grip and fatique reduced work. The strain on the hand is distributed over a larger surface and reduces pressure accordingly. The user still retains the sense for the work on the workpiece.

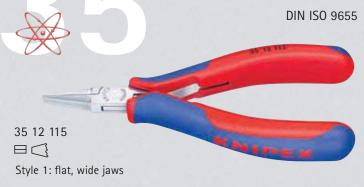


ESD

When using pliers on components endangered by electrostatic discharge (ESDS - electro static discharge sensitive devices) relevant regulations and standards (e. g. IEC TR 61340-5, DIN EN 61340-5, SP Method 2472) require a controlled discharge of electric energy through the handles of such pliers. The KNIPEX Electronics Pliers in ESD version discharge the electrostatic energy correspondingly slowly and under control to protect endangered components.



35 Electronics Pliers

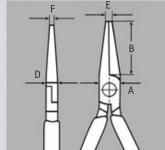


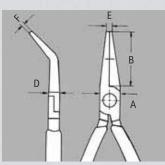
- DIN ISO 9655 ▶ precision pliers for ultra fine assembly work, e.g. in electronics and fine mechanics
 - for gripping, holding and bending
 - precision box joint
 - smooth ground gripping surfaces
 - edges carefully deburred
 - low-friction double spring for gentle and even opening
 - the polish or mirror polish (only finish 2) together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
 - special tool steel, oil-hardened and tempered



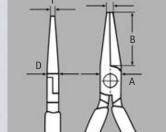
In the design of KNIPEX **Electronics Pliers for gripping** and cutting ergonomic criteria have been given particular attention. The result is a comfortable and user friendly adaption of the plier to the human hand.

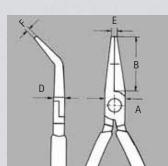
















35 32 115 8

35 22 115 $\Theta \bigcirc$

Style 3: round, pointed jaws

Style 2: half-round jaws



35 52 145

Style 5: long, trapezoidal jaws



8

Style 7: round, long jaws



35 42 115 $\Theta \bigcirc$

Style 4: 45° bent, half-round jaws



35 62 145 0

Style 6: half-round, long jaws



35 82 145 $\theta \triangleleft$

Style 8: 45° bent, half-round, long jaws

EAN-	Style	Head	Handles	Dime	nsion	s			47
Code	all pliers with	•	•	• В	Α	D	Е	F	
4003773-	www 🖶			mm	mm	mm	mm	mm	g
016694	1 —	polished	plastic coated	22.5	9.5	6.5	2.0	4.0	60
035107	. –	mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	4.0	75
016724	2 \ominus -	polished	plastic coated	22.5	9.5	6.5	2.0	1.5	55
035114		mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	1.5	70
016762	3 Q	polished	plastic coated	22.5	9.5	6.5	2.0	1.0	50
035121	3 0	mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	1.0	60
040736	4	mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	1.5	75
039389	5 long jaws	mirror polished	with two-colour dual component handles	40.0	12.0	7.5	1.5	4.0	105
039556	6 long jaws ⊖	mirror polished	with two-colour dual component handles	40.0	12.0	7.5	2.5	1.5	95
043607	7 long jaws	mirror polished	with two-colour dual component handles	40.0	12.0	7.5	2.5	1.3	90
039396	8 ⊖ ∡45°	mirror polished	with two-colour dual component handles	35.0	12.0	7.5	2.5	1.0	95
	Code 4003773- 016694 035107 016724 035114 016762 035121 040736 039389 039556	Code 4003773- 016694 035107 all pliers with WWM □ 016724 035114 1 □ 016762 035121 3 8 □ 040736 4 □ 4 □ 45° 039389 5 long jaws 039556 6 long jaws 043607 7 long jaws 039396 8 long jaws 039396 8 long jaws 039396 8 long jaws	Code 4003773- 016694 035107 all pliers with WWM polished mirror polished 016724 035114 2 ⊕ polished mirror polished 035121 3 8 polished mirror polished 040736 4 ∠45° ⊕ mirror polished 039389 5 long jaws e mirror polished 039556 6 long jaws 8 mirror polished 039396 7 long jaws 8 mirror polished 039396 8 mirror polished	Code 4003773- 016694 035107 all pliers with WWM □ polished plastic coated with two-colour dual component handles 016724 035114 035114 016762 035121 2 ⊕ polished plastic coated mirror polished with two-colour dual component handles 016762 035121 040736 0407	Code 4003773- WWM □B MAND WATE WWM □016694 0016694	Code 4003773- 4003773- 4003773- 016694 035107all pliers with 4003773- 016694 1	Code 4003773- WWM □all pliers with 4003773- WWM □BAD016694 0351071 □polished plastic coated polished with two-colour dual component handles polished mirror polished with two-colour dual component handles polished plastic coated plastic	Code 4003773-	Code 4003773-

35 Electronics Pliers ESD



Style 1: flat, flat wide jaws



Style 2: half-round jaws

- precision pliers for ultra fine assembly work, e. g. in electronics and fine mechanics
- for gripping, holding and bending
- electrically discharging version dissipative
- precision box joint
- ► smooth ground gripping surfaces
- ► edges carefully deburred
- low-friction double spring for gentle and even opening
- the mirror polish together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome
- from plated tools

 ➤ with two-colour dual component handles black/grey
- special tool steel, oil-hardened and tempered



In the design of KNIPEX Electronics Pliers for gripping and cutting ergonomic criteria have been given particular attention. The result is a comfortable and user friendly adaption of the plier to the human hand.



ESD

When using pliers on components endangered by electrostatic discharge (ESDS - electro static discharge sensitive devices) relevant regulations and standards (e. g. IEC TR 61 340-5, DIN EN 61 340-5, SP Method 2472) require a controlled discharge of electric energy through the handles of such pliers. The KNIPEX Electronics Pliers in ESD version discharge the electrostatic energy correspondingly slowly and controlled to protect endangered components.

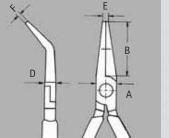


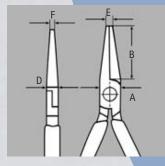
Style 3: round, pointed jaws



Style 4: 45° bent, half-round jaws







Article-No.	EAN-	St	yle	Head	Handles	Din	ensio	ns			47
Lengt	h Code	all	pliers with	•	•	• В	Α	D	Е	F	
mm	4003773	-	www 🖶			mm	mm	mm	mm	mm	g
35 12 115	ESD 024835	1		mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	4.0	75
35 22 115	ESD 024842	2	Θ	mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	1.5	70
35 32 115	ESD 024859	3	8	mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	1.0	60
35 42 115	ESD 024866	4	∡_45°	mirror polished	with two-colour dual component handles	22.5	9.5	6.5	2.0	1.5	75
			Θ								



36 Electronics Mounting Pliers





Model 36 12 130: to bend wire in shape for the distance to the plate

- precision pliers for ultra fine assembly work, e. g. in electronics and fine mechanics
- ► for bending and cutting wire ends
- precision box joint
- smooth ground gripping surfaces
- edges carefully deburred
- ► low-friction double spring for gentle and even opening
- the mirror polish together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
- ► special tool steel, oil-hardened and tempered



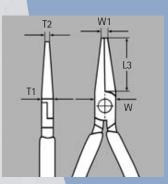


Model 36 22 125: to bend and cut wire at 1.6 mm length below the plate





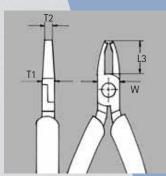
Model 36 32 125: to crunch and cut wire at 1.6 mm length below the plate







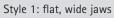
Model 36 42 125 SB: to cut wire at 1.3 mm length below the plate



Article-No.	EAN-	Head	Handles	Style to	Dime	ension	ıs				Δ'Δ
Length	Code	•			L3	W	T1	W1	T2	•	
mm	4003773-				mm	mm	mm	mm	mm	mm	g
36 12 130	016861	mirror polished	with two-colour	bend wire shape	23.0	12.0	7.5	5.5	6.0	-	80
36 22 125	046967		dual component handles	cut at 1.6 mm and bend wire	18.0	11.5	7.5	7.0	2.6	1.2	90
36 32 125	016885			cut at 1.6 mm and crunch wire	18.0	11.5	7.5	7.0	4.0	1.0	90
36 42 125 SE	3 029069			cut wire, distance 1.3 mm	18.0	11.5	7.5	_	4.0	1.2	100

37 Relay Adjusting Pliers for precision mechanics







Style 2: flat, concave and pointed jaws

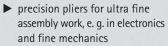


Style 3: half-round jaws

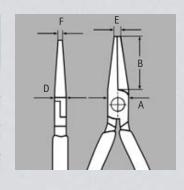


Style 4: round, pointed jaws to bend wire loops

Article-No.	EAN-	Style	Head	Handles	Dim	ensior	IS			Δ'Δ
Length	Code				В	Α	D	Е	F	
mm	4003773-				mm	mm	mm	mm	mm	g
37 11 125	014287	1	polished	plastic coated	27.0	12.5	7.0	2.0	5.5	70
37 13 125	016922		chr. plated	plastic coated	27.0	12.5	7.0	2.0	5.5	70
37 21 125	014294	2	polished	plastic coated	27.0	12.5	7.0	2.0	2.0	75
37 23 125	016946		chr. plated	plastic coated	27.0	12.5	7.0	2.0	2.0	75
37 31 125	014300	3	polished	plastic coated	27.0	12.5	7.0	2.0	1.6	65
37 33 125	016960	Θ	chr. plated	plastic coated	27.0	12.5	7.0	2.0	1.6	65
37 41 125	014317	4	polished	plastic coated	27.0	14.5	8.0	2.0	1.0	75
37 43 125	016977	8	chr. plated	plastic coated	27.0	14.5	8.0	2.0	1.0	75



- for gripping, holding, bending and adjusting
- ▶ tips precision ground
- smooth gripping surfaces
- edges carefully deburred
- ► lap joint
- ► Chrome Vanadium electric steel, oil-hardened and tempered



38 Mechanics' Pliers

DIN ISO 5745



- ▶ high bending strength of the plier jaws/tips
- Vanadium electric steel, oil-hardened and tempered

Style 1: straight, half-round jaws



Style 1: straight, half-round jaws

Style 3: cranked, half-round jaws

38 31 200 Θ





38 71 200



Style 7: 70° bent, half-round jaws, suitable for pulling split pins. For gripping tasks in confined areas



Angled jaws for easy access to confined areas



38 41 190

Style 4: flat, wide jaws



38 91 200

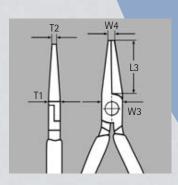


Style 9: 45° bent, half-round, long jaws, also suitable for gripping spark plugs and round components (spark plug cover "grabber")



Especially shaped jaws for easy gripping of spark plugs

Article-No.	EAN-	Style	Head	Handles	Dime	ensior	ıs			7,7
Length	Code		•	•	L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	g
38 11 200	016991	1	polished	plastic coated	73.0	17.5	9.5	3.0	2.5	180
38 15 200	039594	Θ	chrome	with two-colour	73.0	17.5	9.5	3.0	2.5	210
			plated	dual component handles						
38 21 200	017066	2	polished	plastic coated	73.0	17.5	9.5	3.0	2.5	175
38 25 200	043669	Θ	chrome	with two-colour	73.0	17.5	9.5	3.0	2.5	205
		∡ 40°	plated	dual component handles						
38 31 200	017110	3	polished	plastic coated	73.0	17.5	9.5	3.0	2.5	175
38 35 200	017134	Θ	chrome	with two-colour	73.0	17.5	9.5	3.0	2.5	205
			plated	dual component handles						
38 41 190	017141	4	polished	plastic coated	50.0	18.0	8.0	2.0	8.0	140
38 45 190	043676		chrome	with two-colour	50.0	18.0	8.0	2.0	8.0	175
			plated	dual component handles						
38 71 200	017202	7	polished	plastic coated	73.0	17.5	9.5	3.0	2.0	175
		∡ 70°								
38 91 200	017219	9	polished	plastic coated	73.0	17.5	9.5	-	2.5	180
38 95 200	017233	∡_45°	chrome	with two-colour	73.0	17.5	9.5	-	2.5	210
			plated	dual component handles						



40 Universal Grip Pliers



- holds round, section and flat material securely
- heavy duty model
- with adjustment screw and release lever
- ▶ one-hand operation
- ► high clamping pressure due to toggle lever action
- plier body: high strength spring steel
- inserted jaws made from Chrome Vanadium steel, drop forged

Article-No.	EAN-	Head	Handles	Clampii	ng width		2,7
Length	Code		•	(C)		\bigcirc	
mm	4003773-			mm	mm	mm	g
40 04 180	022190	nickel plated	nickel plated	8 - 35	25	6 - 26	325
250	002710	nickel plated	nickel plated	8 - 35	30	8 - 30	530

41 Grip Pliers



41 04 250

Style 0: jaws for round workpieces, with wire cutter

- holds round, section and flat material securely
- ► heavy duty model
- with adjustment screw and release lever
- ▶ one-hand operation
- high clamping pressure due to toogle lever action
- plier body: high strength spring steel
- ► inserted jaws made from Chrome Vanadium steel, drop forged



Style 1: jaws with double prism for round, section and flat material



Example 41 14 250



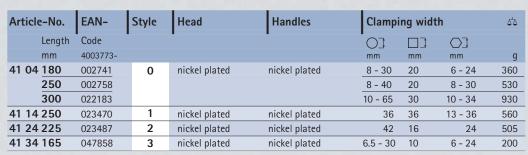






41 24 225

Style 2: straight jaws for flat material



600

41 34 165

Style 3: Long-Nose Grip Pliers, narrow, long jaws

42 Welding Grip Pliers



42 14 280

□ 4 0-25 mm

- ► for gripping and clamping round, section and flat material
- ► heavy duty model
- with adjustment screw and release lever
- ▶ one-hand operation
- high clamping pressure due to toogle lever action
- plier body: high strength spring steel



Secure fixing of metal section material for welding

Model 42 14 280:

- heat resistant crucible cast steel jaws
- section or flat material items lying side by side are held securely during welding
- ► also for section material with vertical webs up to 25 mm height

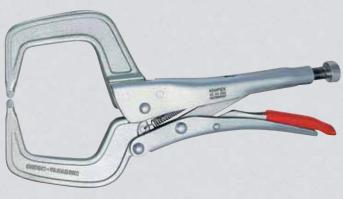


42 24 280



Model 42 24 280:

- heat resistant crucible cast steel jaws
- round or tubular material items lying centrally side by side are held securely during welding



42 34 280

0-40 mm

10	1

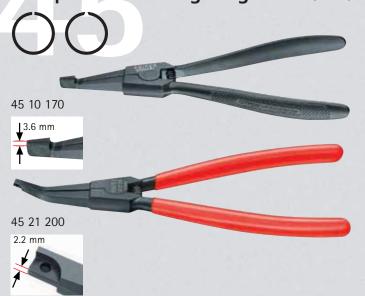
Model 42 34 280:

- gripping jaws of ChromeVanadium steel, drop forged
- clamps cumbersome workpieces and sections with high webs up to 40 mm

Article-No.	EAN-	Head	Handles	Clampir	ng width	47
Length	Code	•		0]		
mm	4003773-			mm	mm	g
42 14 280	022206	nickel plated	nickel plated	30 - 65	51	915
42 24 280	022213	nickel plated	nickel plated	10 - 85	-	860
42 34 280	022220	nickel plated	nickel plated	-	90	700



45 Special Retaining Ring Pliers (shafts)



Model 45 10 170:

- ► for retaining rings with a minimum ring split gap of 3.6 mm
- ► for fitting horseshoe-shaped spring retaining rings and circlips without grip holes
- ► for shaft retaining devices
- with opening spring
- ► forged
- ► Chrome Vanadium steel, oil-hardened and tempered

Model 45 21 200:

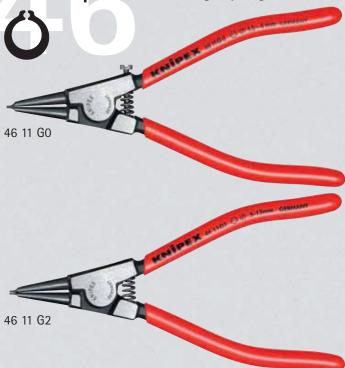
- angled jaws with centering hole
- for retaining rings according to standard from 12.0 mm dia.,
 e. g. for securing drive shaft in the gearbox of a motor vehicle
- minimum ring split gap of the rings 2.2 mm



45 21 200: *Tips with center holes for secure fit of the retaining ring*

Article-No. EAN-Style Head Handles △ Length Code mm 4003773g 45 10 170 017370 burnished burnished 155 45 21 200 031208 burnished plastic coated

46 Circlip Pliers for fitting Grip Rings (shafts)



- ► for fitting grip rings on shafts from 1.5 30 mm dia.
- with opening spring
- solid style, forged
- non-slip, solid tips
- Chrome Vanadium electric steel, oil-hardened and tempered

Model 46 11 GO:

 for rings of 1.5 - 4.0 mm dia., with adjustable stop screw to prevent overstretching



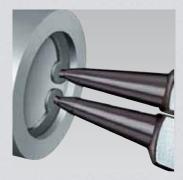
Article-No.	EAN-	Style	Head	Handles	Size of shaft		44
Size	Code	•	•	•	•	Length	
	4003773-				mm	mm	g
46 11 G0	047896	WWW.	polished	plastic coated	1.5 - 4	140	80
G1	031062				4 - 7	140	80
G2	031079				5 - 13	140	80
G3	031086				14 - 18	140	80
G4	031093				20 - 30	180	140

44 Internal Circlip Pliers (bore holes)

Style 1: straight tips



- ► for fitting internal circlips in bore holes from 8 400 mm dia.
- ► solid style, forged
- ▶ non-slip, solid tips
- Chrome Vanadium electric steel, oil-hardened and tempered



Easy fitting of internal circlips





Models 44 10 and 44 20:

- ► for rings from 122 400 mm dia.
- with locking device, can be released
- with replaceable tips made of tempered steel
- ▶ black powder coated

Article-No.	EAN-	Style	Head	Handles	Size of bore		47
Size	Code		•		•	Lengt	:h
	4003773-				ø mm	mm	g
44 11 <u>J0</u>	017240	1	polished	plastic coated	8 - 13	140	90
<u>J1</u>	013570				12 - 25	140	90
J2	013587				19 - 60	180	140
<u>J3</u>	013594	_			40 - 100	225	200
J4	013600	А			85 - 140	320	465
44 10 <u>J5</u>	024910		black powde	r coated	122 - 300	570	1710
J6	024927				252 - 400	580	1730
44 19 J5	024934	' '	spare tips				
J6	024941	straight	spare tips				
44 13 <u>J0</u>	017264		chrome	plastic-coated	8 - 13	140	90
<u>J1</u>	017271		plated		12 - 25	140	90
<u>J2</u>	017288				19 - 60	180	140
<u>J3</u>	017295				40 - 100	225	200
J4	017301				85 - 140	320	465
44 21 <u>J01</u>	017318	2	polished	plastic coated	8 - 13	130	90
<u>J11</u>	013617				12 - 25	130	90
<u>J21</u>	013624				19 - 60	170	140
<u>J31</u>	013631				40 - 100	215	205
J41	013648				85 - 140	300	480
44 20 <u>J51</u>	024958	11	black powde	r coated	122 - 300	590	1980
J61	024965				252 - 400	600	1990
44 29 <u>J51</u>	024972		spare tips				
J61	024989		spare tips				
44 23 <u>J11</u>	017332		chrome	plastic coated	12 - 25	130	90
<u>J21</u>	017349		plated		19 - 60	170	140
J31	017356				40 - 100	215	205



00 19 56

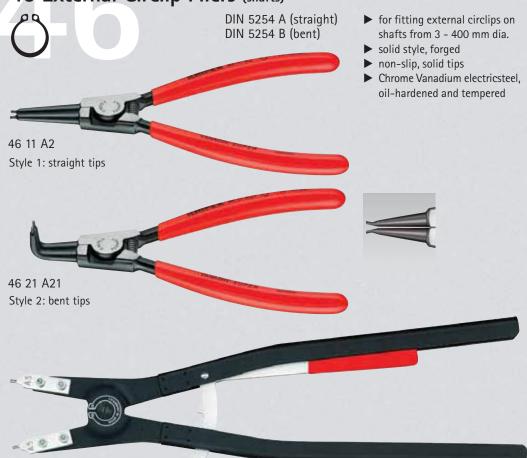
Loosen tight circlips before removing these.

Only use circlip pliers for the specified diameter range.

We recommend wearing safety goggles when working with these pliers.

46 External Circlip Pliers (shafts)

46 10 A5





Easy fitting of external circlips

Models 46 10 and 46 20:

- ► for rings from 122 400 mm dia.
- with locking device, can be released
- without opening spring
- with replaceable tips made of tempered steel
- black powder coated

Article-No.	EAN-	Style	Head	Handles	Size of shaft		47
Size	Code		•	•		Lengt	h
	4003773-				ø mm	mm	g
46 11 A0	013655	1	polished	plastic coated	3 - 10	140	85
A1	013662				10 - 25	140	85
A2	013679	*****			19 - 60	180	140
A3	013686				40 - 100	210	215
A4	013693	Н			85 - 140	320	530
46 10 <u>A5</u>	024996		black powde	r coated	122 - 300	560	2020
A6	025009				252 - 400	570	2030
46 19 <u>A5</u>	024316	, ,	spare tips				
A6	025016	straight	spare tips				
46 13 A0	017417		chrome	plastic coated	3 - 10	140	85
A1	017424		plated		10 - 25	140	85
A2	017431				_19 - 60	180	140
А3	017455				40 - 100	210	215
46 21 A01	013709		polished	plastic coated	3 - 10	125	85
A11	013716	2			10 - 25	125	85
A21	013723	4444			19 - 60	170	135
A31	013730	www.			40 - 100	200	215
A41	013747				85 - 140	300	515
46 20 A51	025023	لللم م	black powde	r coated	122 - 300	570	1810
A61	025030				252 - 400	580	1820
46 29 A51	025047	11	spare tips				
A61	025054	, ,	spare tips				
46 23 A01	017509		chrome	plastic coated	3 - 10	125	85
A11	017516		plated		10 - 25	125	85
A21	017523				19 - 60	170	135
A31	017530				40 - 100	200	215



00 19 56

Loosen tight circlips before removing these.

Only use circlip pliers for the specified diameter range.

We recommend wearing safety goggles when working with these pliers.

48 Precision Internal Circlip Pliers (bore holes)



- ► for fitting circlips on bore holes, range of application from 8 - 140 mm dia.
- inserted tips of high density drawn spring wire
- heavy duty under continuous use; up to 10 times longer service life
- precise, smoothly-operating screw joint
- ▶ forged
- ► large contact faces on the tips: no distortion of circlips, easy fitting
- slim head style allows use in confined areas
- handles with non-slip plastic coating
- ► Chrome Vanadium electric steel



The new KNIPEX Precision

Circlip Pliers meet highest requirements.

Positive locked high density spring wire tips offer
10 times longer sevice life compared with conventional circlip pliers and high stability when loosening tight circlips. Circlips are held securely thanks to the large contact faces of the tips.



00 19 57



Sturdy, inserted tips: made from high density drawn spring wire



Circlips are held securely: large contact faces and the position of the tips make it difficult for the circlip to bounce off



Slim head style: allows use in confined areas



Screw joint: high precision and optimum drive

Article-No.	EAN-	Style	Head	Handles	Size of bore	!		4
Size	Code			·		Tips	Length	
	4003773-				ø mm	ø mm	mm	g
48 11 J0	048510	1	grey	with non-slip	8 - 13	0.9	140	100
J1	048527	Д	atramentized	plastic coating	12 - 25	1.25	140	100
J2	048534				19 - 60	1.8	180	180
J3	048541				40 - 100	2.25	225	260
J4	048558				85 - 140	2.3	320	580
		straight						
48 21 J01	048619	2	grey	with non-slip	8 - 13	0.9	130	100
J11	048633		atramentized	plastic coating	12 - 25	1.25	130	100
J21	048640				19 - 60	1.8	165	180
J31	J31 048657				40 - 100	2.25	210	260
J41	048664				85 - 140	3.2	305	580
		, ,						

Loosen tight circlips before removing these.

Only use circlip pliers for the specified diameter range.

We recommend wearing safety goggles when working with these pliers.

49 Precision External Circlip Pliers (shafts)



- for fitting circlips on shafts, range of application from 3 - 140 mm dia.
- inserted tips of high density drawn spring wire
- heavy duty under continuous use; up to 10 times longer service life
- precise, smoothly-operating screw joint
- ▶ forged
- large contact faces on the tips: no distortion of circlips, easy fitting
- slim head style allows use in confined areas
- protected captive spring in the ioint
- ► handles with non-slip plastic coating
- ► Chrome Vanadium electric steel

Model 49 31 A0/49 41 A01:

- with additional limiter (continuously adjustable opening area)
- avoids overstretching of small external circlips



The new KNIPEX Precision Circlip Pliers meet highest requirements.

Positive locked high density spring wire tips offer 10 times longer sevice life compared with conventional circlip pliers and high stability when loosening tight circlips. Circlips are held securely thanks to the large contact faces of the tips. The large contact areas as well as the position of the tips ensure fitting without distorsion and make it difficult for the circlip to bounce off. The opening spring is protected inside the screw joint.



00 19 57



Spring inside the joint: the spring is protected inside the precision screw joint. It does not hinder work and can't get dirty or lost



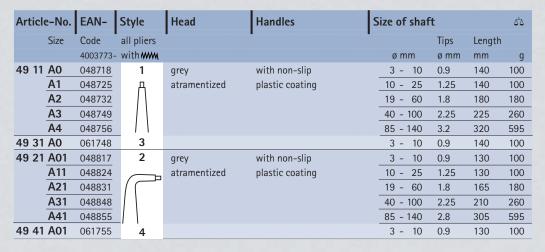
KNIPEX Precision Circlip Pliers: fit circlips without distortion; easy and quick assembling



Conventional Circlip Pliers:distortion of the circlip when being fitted is possible



Heavy duty tips: optimum stability when loosening tight circlips





49 31 AO/49 41 AO1: with adjustable opening area

50 Carpenters' Pincers

DIN ISO 9243



50 00 210

- For heaviest duty
 - specially favoured by craftsmen due to precision workmanship
 - extreme wear resistance and good balance
 - special tool steel, oil-hardened and tempered





50 01 225

Article-No.	EAN-	Head	Handles	<u>Δ</u> Δ
Length		1	Thanks and the second s	
mm	4003773-			g
50 00 130	014423	polished	black atramentized	125
160	013129	·		210
180	013136			310
210	013143			400
225	013150			420
250	013167			580
300	015710			880
50 01 130	015789	polished	plastic coated	140
160	015802			225
180	016021			325
210	016052			415
225	016083			435
250	016267			600
300	016915			900

51 Carpenters' Pincer with striking face

DIN ISO 9243



- with striking face for driving in nails
- special tool steel, oil-hardened and tempered

51 01 210

Article-No.	EAN-	Head	Handles	44
Length	Code		·	
mm	4003773-			g
51 01 210	014065	polished	plastic coated	425



Multi-functional: driving in and pulling nails

55 Farriers' Pincer, Hamburg pattern

DIN 5173

- ► the ideal plier for the farrier
- with small head and reversing groove
- also suitable for dismantling work in vehicle body workshops
- cutting edge hardness approx.55 HRC
- special tool steel, oil-hardened and tempered

55 00 300

Article-No.	EAN-	Head	Handles	Head width	2,7
Length	Code				
mm	4003773-			mm	g
55 00 300	014072	polished	black atramentized	20	785

56 Farriers' Pincer, Vienna pattern



- with wide head
- cutting edge hardness approx.55 HRC
- special tool steel, oil-hardened and tempered



Model 55 00 300: Dismantling work in car body construction

56 00 325

Article-No.	EAN-	Head	Handles	Head width	7,7
Length	Code				
mm	4003773-			mm	g
56 00 325	017592	polished	black atramentized	33	1020

57 Unsoling Pincer for horse shoeing



- ► for the farrier
 - also suitable for dismantling work in vehicle body workshops
 - also for dismantling work on timber and metal
 - special tool steel, oil-hardened and tempered

57 00 360

Article-No.	EAN-	Head	Handles	Head width	۵,7
Lengt	h Code				
mm	4003773-			mm	g
57 00 360	017622	polished	black atramentized	30.5	1160

58 Potters' Pincers, Brick Pincers



- for pottery work
- with wire cutter for soft wire
- special tool steel, oil-hardened and tempered

Model 58 10 225:

▶ head width 10 mm

Model 58 30 225:

▶ head width 20 mm

58 10 225

Ì						
	Article-No.	EAN-	Head	Handles	Head width	47
ı	Length	Code				
	mm	4003773-			mm	g
	58 10 225	017646	polished	black atramentized	10	345
į	58 30 225	014331	polished	black atramentized	20	350



99 Concretors' Nippers, Tower Pincers/Steel Fixers Nippers



- ► to twist and cut wire in one operation: fast, reliable and economical
- unobtained precision and long service life make these the most widely purchased concretors' nippers in the world
- special tool steel, oil-hardened and tempered

Model 99 00 220 K12:

with 12 mm head, particularly suitable for tile paving work

99 01 220

Article-No.	EAN-	Head	Handles	47
Length	Code	•	•	
mm	4003773-			g
99 00 200	014393	polished	black atramentized	235
220	013273			320
250	013280			400
280	014096			405
300	014409			510
99 01 200	021452	polished	plastic coated	250
220	021469			340
250	021483			425
280	021490			485
300	014416			555
99 00 220 K1	2 027812	polished	black atramentized	320

99 High Leverage Concretors' Nippers, high lever transmission

DIN ISO 9242



- ► to twist and cut thicker wire in one operation: fast, reliable and economical
- very slim shape for tying submerged positioned steel rods
- cutting capacity: binding wire up to max. 4.5 mm dia.
- particularly high cutting capacity with minimum effort due to optimum transmission ratio
- high damping of the cutting stroke after cutting the binding wire, which reduces strain on tendons and muscles
- special tool steel, oil-hardened and tempered





99 11 300

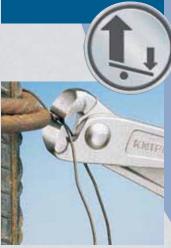
Article-No.	cle-No. EAN- Head		Head width	Handles	Capacitiy	47
Length	Code 4003773-					
mm			mm		ø mm	g
99 10 300	022398	polished	25	black atramentized	4.5	475
99 11 300	023210	polished	25	plastic coated	4.5	510
99 14 300	028116	nickel plated	25	nickel plated	4.5	475



KNIPEX High Leverage
Concretors' Nippers offer
substantially higher cutting
performance as well as a
damping of the cutting stroke
after cutting the binding wire
– two valuable ergonomical
advantages for the user.

Requires 27% less effort.

Cutting a binding wire of 3.0 mm dia. with a High Leverage Concretors' Nipper requires handforce of only 300 N (30.0 kp) instead of 412 N (41.2 kp) with a common Concretors' Nipper of the same length.



Quick and comfortable twisting and cutting of binding wire



61 Bolt End Cutting Nipper



61 01 200

- better handling, greater capacity and lower handforce required compared to conventional bolt end cutting nippers
- with cutting edges for soft, hard and piano wire
- particularly high cutting capacity with minimum effort due to optimum transmission ratio
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- ► forged
- Vanadium electric steel, oil-hardened and tempered



High cutting performance: also for piano wire



Particularly efficient for fence construction



Flush cutting of bolts, nails, etc.

Article-No.	EAN-	Head	Handles	Cutting	ј сара	cities		Δ'Δ
Length	Code					•		
mm	4003773-			ømm	ømm	ømm	ømm	g
61 01 200	026723	polished	plastic coated	1.0 - 6.0	4.0	3.5	3.0 max.	460

DIN ISO 9654

62 Electronics Oblique Cutting Nipper



- with cutting edges for soft and medium hard wire
- without bevel, for flush cutting
- cutting edge hardness approx.58 HRC
- low-friction double spring for gentle and even opening
- ▶ precision box joint
- ▶ the polish together with a fine film of oil offer the best possible rust protection – no circuit faults caused by peeling chrome from plated tools

Article-No.	EAN-	Style	Head	Handles	Cutting ca	pacities	44
Länge	Code						
mm	4003773-				ømm	ømm	g
62 12 120	048008		polished	with two-colour dual component handles	0.3 - 1.0	0.7	90



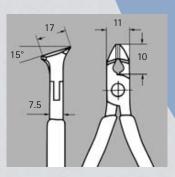
KNIPEX Bolt End Cutting
Nippers are clearly lighter
in weight and more
comfortable in use than
conventional Bolt End Cutting
Nippers — nevertheless
they offer a higher cutting
performance.

Four advantages



compared with conventional Lever Action End Cutting Nippers of the same size

- high cutting performance:e. g. piano wire up to 3.0 mm dia.
- easier cutting: thanks to high leverage
- handy: compact design, reduced weight
- smooth operation, less friction: single joint instead of toggle lever technique
- special tool steel, oil-hardened and tempered





64 52 115

64 62 120

 $\alpha = 65^{\circ}$

64 72 120

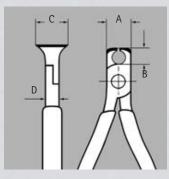
Style 5: Oblique End Cutter,

short head, without bevel, for flush cutting, $\alpha = 27^{\circ}$

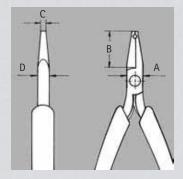
Style 6: Oblique End Cutter,

mini-blade with small bevel,

- ▶ precision pliers for ultra fine cutting work, e. g. in electronics and fine mechanics
- precision box joint
- low-friction double spring for gentle and even opening
- the polish or mirror polish (only finish 2) together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
- cutting edge hardness at least 56 HRC
- special tool steel, oil-hardened and tempered



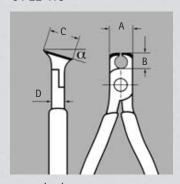
64 12 115



64 22 115



64 22 115 64 62 120 differently shaped jaws and mini-blades for flush cutting in confined areas



64 32/42/52 115



Style 3: Oblique End Cutter, short head, with small bevel, $\alpha = 15^{\circ}$

Style 2: End Cutter, mini-blade

64 12 115

64 22 115

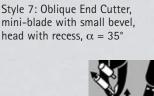
with small bevel

Style 1: End Cutter,

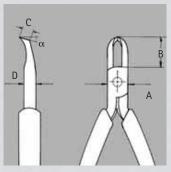
with small bevel



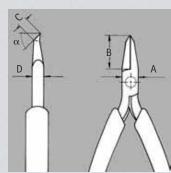
Style 4: Oblique End Cutter, short head, with small bevel,











$\alpha = 27^{\circ}$	α = 27°				64 72 120 64 72 120				64 62 120					
Article-No.	EAN-	Style	Head	Handles		Dime	nsions			Cuttir	ng capa	cities	Δ'Δ	
Length	Code	all pliers with	•	•		В	Α	D	С			•		
mm	4003773-	- 				mm	mm	mm	mm	ømm	ømm	ømm	g	
64 01 115	017745	0	polished	plastic coated		6.0	11.0	7.5	16.0	2.0	1.0	0.6	80	
64 02 115	035343		mirror polished	with two-colour		6.0	11.0	7.5	16.0	2.0	1.0	0.6	90	
				dual component ha	indles									
64 11 115	017769	1	polished	plastic coated		6.0	11.0	7.0	16.0	1.4	0.8	-	80	
64 12 115	040743		mirror polished	with two-colour		6.0	11.0	7.0	16.0	2.0	8.0	0.5	90	
64 22 115	017806	2		dual component	4 11 1	20.0	10.0	6.0	3.0	0.8	-	-	70	
64 32 120	017820	3		handles	A/A	10.0	11.0	7.0	17.0	1.5	1.0	0.5	90	
64 42 115	017844	4			是自然	10.3	10.0	7.0	12.0	1.5	1.0	0.5	70	
64 52 115	040439	5			Print	10.0	10.0	7.0	12.0	1.3	-	-	70	
64 62 120	046998	6		Pliers sets		18.5	9.5	6.0	5.0	0.6	-	-	70	
64 72 120	017882	7		see page 157		19.5	12.0	7.0	5.0	1.5	-	-	90	

64 Electronics End Cutting Nippers ESD



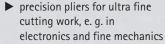


Style 3: Oblique End Cutter, with small bevel,



Style 6: Oblique End Cutter, mini-blade with small bevel,

 $\alpha = 65^{\circ}$



- electrically discharging version dissipative
- precision box joint
- low-friction double spring for gentle and even opening
- the mirror polish together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
- cutting edge hardness at least 56 HRC
- with two-colour dual component handles, black/grey
- special tool steel, oil-hardened and tempered



ESD

When using pliers on components endangered by electrostatic discharge (ESDS - electro static discharge sensitive devices) relevant regulations and standards

(e. q. IEC TR 61 340-5, DIN EN 61 340-5, SP Method 2472) require a controlled discharge of electric energy through the handles of such pliers.

The KNIPEX Electronics Pliers in ESD version discharge the electrostatic energy correspondingly slowly and under control to protect endangered components.

~	_ 05														
Ar	ticle-No.	EAN-	Style	Head	Handles	Dimensions				Cutting capacities ರು					
	Length	Code	all pliers with			В	Α	D	С						
	mm	4003773	- 中 MMM			mm	mm	mm	mm	ø mm	ømm	ø mm	g		
64	12 115 ESD	024323	1 🖊	mirror polished	with two-colour	6.0	11.0	7.0	16.0	2.0	8.0	0.5	90		
64	1 32 120 ESD	025078	3		dual component handles	10.0	11.0	7.0	17.0	1.5	1.0	0.5	90		
64	1 62 120 ESD	025085	6 /			18.5	9.5	6.0	5.0	0.6	-	-	70		

67 High Leverage End Cutting Nippers

00 20 17



- with cutting edges for soft, hard and piano wire
- high cutting capacity with little effort due to optimum coordination of cutting edge angle and transmission ratio
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- Chrome Vanadium electric steel, oil-hardened and tempered



Induction hardened precision blades also suitable for piano wire

Article-No.	EAN-	Head	Handles	Cutti	Cutting capacities			Δ'Δ
Lengt	h Code	•		'•		•		
mm	4003773-			ø mm	ømm	ømm	ømm	g
67 01 140	013761	polished	plastic coated	4.0	3.1	2.0	1.5	145
160	013778			4.0	3.4	2.5	2.0	240
200	013785			4.0	4.2	3.0	2.5	330
67 05 140	017929	chrome plated	with two-colour	4.0	3.1	2.0	1.5	180
160	017936		dual component handles	4.0	3.4	2.5	2.0	275
200	017943			4.0	4.2	3.0	2.5	375

68 End Cutting Nippers

DIN ISO 5748



68 01 200

- with cutting edges for soft and hard wire
- also suitable for twisting and cutting binding wire
- cutting edges additionally induction hardened, cutting edge hardness approx. 61 HRC
- high grade special tool steel, oil-hardened and tempered



Also suitable for wire netting in reinforced concrete construction

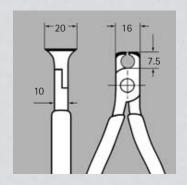
Α	rticle-No.	EAN-	Head	Handles	Cuttir	ng capa	cities	47
	Length	Code						
	mm	4003773-			ømm	ømm	ømm	g
6	8 01 160	013792	polished	plastic coated	4.0	2.8	2.3	195
	180	013808			4.0	3.2	2.5	275
	200	013815			4.0	3.5	2.8	335

69 Mechanics End Cutting Nippers



- with cutting edges for soft, hard and piano wire; also suitable for thin copper wires
- ▶ lap joint
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- Chrome Vanadium electric steel, oil-hardened and tempered

Article-N	o. EAN-	Head	Handles	Cuttin	Cutting capacities			7.7
Leng	gth Code	•				•		
mm	4003773-			ø mm	ømm	ømm	ømm	g
69 01 130	0 017974	polished	plastic coated	0.4 - 2.0	1.3	1.0	0.75	115
69 03 130	018001	chrome plated	plastic coated	0.4 - 2.0	1.3	1.0	0.75	115



70 Diagonal Cutters

DIN ISO 5749









- ► the indispensable diagonal cutter for all-round use
- ► high quality material and precise workmanship for long service life
- precision cutting edges for soft and hard wire
- clean cutting at cutting edge tips; also in case of thin copper wires
- cutting edges additionally induction hardened, cutting edge hardness approx. 62 HRC
- narrow head style for use in confined areas
- Vanadium electric steel, oil-hardened and tempered

Style 0:

▶ with bevel

Style 1:

- with bevel
- with opening spring

Style 2:

with small bevel



The cutting edges of KNIPEX Diagonal Cutters – made of Vanadium steel – have a long service life, are machined highly precise and are very sharp - for a clean cut of soft and hard wires.

	l	C. 1	l	L	١		.,.	
Article-No.	EAN-	Style	Head	Handles	Cuttii	ng capa	icities	47
Length	Code						9	
mm	4003773-				ømm	ømm	ømm	g
70 01 110	014324	0	polished	plastic coated	3.0	2.0	1.2	80
125	013402				3.0	2.3	1.5	90
140	013419				4.0	2.5	1.8	125
160	013426				4.0	2.8	2.0	175
180	018070				4.0	3.0	2.5	200
70 02 125	034025		polished	with two-colour	3.0	2.3	1.5	115
140	023098			dual component handles	4.0	2.5	1.8	155
160	034032				4.0	2.8	2.0	205
180	034049				4.0	3.0	2.5	250
70 04 140	018100		chr. plated	chrome plated	4.0	2.5	1.8	105
70 05 125	039501		chrome	with two-colour	3.0	2.3	1.5	115
140	039488		plated	dual component handles	4.0	2.5	1.8	155
160	039600				4.0	2.8	2.0	205
180	043706				4.0	3.0	2.5	250
70 06 125	018124		chrome	insulated with two-colour	3.0	2.3	1.5	120
140	040293		plated	dual component handles	4.0	2.5	1.8	160
160	021995			≙ 1000 V △	4.0	2.8	2.0	210
180	033813			VDE-tested	4.0	3.0	2.5	255
70 07 160	018155		chrome	plastic dipped insulated	4.0	2.8	2.0	240
180	018179		plated	A 1000 V △ P VDE-tested	4.0	3.0	2.5	285
70 11 110	018193	1	polished	plastic coated	3.0	2.0	1.2	80
70 15 110	029649	www	chrome	with two-colour	3.0	2.0	1.2	105
			plated	dual component handles				
70 26 160	018223	2	chrome	insulated with two-colour	4.0	-	-	210
			plated	dual component handles 🕸 1000 V		VDE-test	ed	



Cuts fine wires cleanly over the complete length of the blades



Slim head style and precise cut at blade tips: Advantageous when working in confined areas

71 KNIPEX-"CoBolt", Compact Bolt Cutters (Lever Action Center Cutters)

patented



71 01 200





71 11 200



Style 1:

with opening spring and stirrup lock

- with precision blades for soft, hard and piano wire
- cuts material like bolts, nails, rivets, etc. up to 5.2 mm dia.
- exceptional cutting performance with minimum effort because of new lever action design
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- ▶ forged
- Chrome Vanadium electric steel, oil-hardened and tempered

► the recess in the blade allows easier cutting of thicker wires, e. g. for false ceilings



The KNIPEX Compact Bolt Cutter is a "clever muscle man". The newly designed lever action mechanism guarantees an extremely favourable lever ratio with low friction. The cutting performance is 20 times higher than the handforce applied.

Requires 61% less effort.

Cutting a piano wire of 2.0 mm dia. with the KNIPEX-"CoBolt" requires handforce of 192 N (19.2 kp) instead of 499 N (49.9 kp) with a High Leverage **Diagonal Cutter of** the same length.



71 31 200: The recess near the joint keeps thicker wires to be cut in a secure position, ensuring optimum application of cutting performance

Article-No. EAN- Style Handles Head **Cutting capacities** $\Delta \Delta$ Length Code mm 4003773ømm ømm ømm ømm g 71 01 200 010067 atramentized plastic coated 6.0 5.2 4.0 3.6 340 71 02 200 047056 with two-colour atramentized 6.0 5.2 4.0 3.6 380 dual component handles 71 11 200 022312 atramentized plastic coated 6.0 5.2 4.0 3.6 350 WWW **71 31 200** 030805 3 atramentizedplastic coated 6.0 5.2 4.0 3.6 340

72 Diagonal Cutter for fibre optics (Glass Fibre Cable)



- specially developed for cutting glass fibre cable (fibre optics)
- cutting face flush ground
- cutting edges additionally induction hardened
- with opening spring
- Vanadium electric steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	۵۶
Length	Code		·	
mm	4003773-			g
72 51 160	028031	polished	plastic coated	170

72 Diagonal Cutters for plastics and lead



- cutting face flush ground
- non-bevelled, for flush cutting sprues off plastic components or soft materials such as lead
- with opening spring
- Vanadium electric steel, oil-hardened and tempered



72 11 160

Style 1: 45° angled blades



72 21 160

Style 2: 85° angled blades

Artic	ele-No.	EAN-	Style	Head	Handles	₹2
	Length	Code	all pliers with	•		
	mm	4003773-	MMM			g
72 0	1 140	018247	0	polished	plastic coated	115
	160	013389				170
	180	028482				200
72 0	2 125	044215		polished	with two-colour dual component handles	95
72 1	1 160	018261	1 <u></u> ∠45°	polished	plastic coated	150
72 2	1 160	026914	2 ≰_85°	polished	plastic coated	160

74 Center Cutter



74 91 250





fixed, forged-on axle

Article-No. EAN-Head **Cutting capacities** Handles Length Code mm 4003773 ø mm ømm ømm ømm g **74 91 250** 013396 polished plastic coated 5.0 3.8 3.5 395

- with forged-on axle for heaviest duty
- with precision cutting edges for soft, hard and piano wire
- cuts hard, thick wires with less effort than other diagonal cutters of the same length
- ► centric precision cutting edges
- high cutting performance with minimum effort due to optimum co-ordination of the cutting edge angle, transmission ratio and ergonomic handle shape
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- ► Chrome Vanadium electric steel, oil-hardened and tempered



The cutting edges are in the center of the cutter head

74 High Leverage Diagonal Cutters

DIN ISO 5749



74 21 200

axle

fixed, forged-on

- with forged-on axle for heaviest duty
- suitable for all types of wire including piano wire
- ▶ high cutting performance with minimum effort due to optimum co-ordination of the cutting edge angle, transmission ratio and ergonomic handle shape
- precision cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- ► the 250-mm-long diagonal cutter is suitable for copper conductors up to 16 mm² and aluminium conductors up to 35 mm²
- Chrome Vanadium electric steel, oil-hardened and tempered

Style 1:

with opening spring; to be activated if required

Style 2

≈ 70 mm

► 12° angled head for flush cutting, providing space for gripping



The choice of material (Chrome Vanadium), lever ratio and cutting edge angle mean that KNIPEX High Leverage Diagonal Cutters are particularly designed for the cutting of hard wires. Fixed, forged-on axle for work under continuous stress.

Requires 21% less effort.

Cutting a medium hard wire of 2.5 mm dia. with a High Leverage Diagonal Cutter (length 160 mm) requires an handforce of only 293 N (29.3 kp) instead of 370 N (37.0 kp) with a common Diagonal Cutter of the same length.

Article	-No.	EAN-	Style	Head	Handles	Cuttin	ıg capa	cities	47
	Length		'						
	mm	4003773-				ømm	ømm	ømm	g
74 01	140	013433		polished	plastic coated	3.1	2.0	1.5	130
-	160	013440				3.4	2.5	2.0	180
7	180	013457				3.8	2.7	2.2	220
	200	013464				4.2	3.0	2.5	260
	250	013471				4.6	3.5	3.0	390
74 02	140	042419		polished	with two-colour	3.1	2.0	1.5	160
7	160	023081			dual component handles	3.4	2.5	2.0	210
1	180	023074				3.8	2.7	2.2	255
-	200	040309				4.2	3.0	2.5	300
	250	042402				4.6	3.5	3.0	420
74 05	140	039617		chrome	with two-colour	3.1	2.0	1.5	160
	160	022961		plated	dual component handles	3.4	2.5	2.0	210
	180	022978				3.8	2.7	2.2	255
3	200	035367				4.2	3.0	2.5	300
:	250	039754				4.6	3.5	3.0	420
74 06	160	040705		chrome	insulated with two-colour	3.4	2.5	2.0	215
	180	022985		plated	dual component handles	3.8	2.7	2.2	260
- 3	200	033820			≙ 1000 V △	4.2	3.0	2.5	305
:	250	041955			VDE-tested	4.6	3.5	3.0	440
74 07		018414		chrome	plastic dipped insulated	4.2	3.0	2.5	340
	250	018421		plated	A 1000 V ♠ VDE-tested	4.6	3.5	3.0	475
74 12		065111	1 MMM	polished	with two-colour	3.4	2.5	2.0	210
74 12		060192		polished	dual component handles	3.8	2.7	2.2	255
74 21		034322	2	polished	plastic coated	3.4	2.5	2.0	180
74 21 2		034636	∡_12°	polished	plastic coated	4.2	3.0	2.5	260
74 22 2	200	051831		polished	with two-colour dual component handles	4.2	3.0	2.5	300



74 12 180: The opening spring can be activated by simply pressing with the thumb



74 12 180: View of the rear side with activated opening spring

75 Electronics Diagonal Cutters, slim pattern

DIN ISO 9654 75 02 125 screw joint Style 0: with bevel

Style 1:

be unscrewed), no uncontrolled

- with bevel and lead catcher (can loss of cut wire ends
- Style 5:

75 12 125

75 52 125

particularly narrow head, with bevel

- precision pliers for ultra fine cutting work, e.g. in electronics and fine mechanics
- with precision cutting edges for soft and hard wire, also suitable for thin piano wire
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- low-friction double spring for gentle and even opening
- high grade special tool steel, oil-hardened and tempered

Style 2:

with small bevel

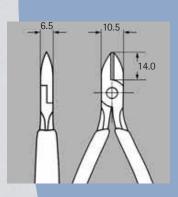
Style 3:

▶ with small bevel and lead catcher (can be unscrewed), no uncontrolled loss of cut wire ends

Article-No.	EAN-	Style	Head	Handles	Cutting	capac	ities		7.7
Length	Code	all pliers	•				•		
mm	4003773-	- MWM			ø mm	ø mm	ømm	ø mm	g
75 02 125	040491	0	burnished	with plastic handles	0.2 - 1.3	1.0	0.6	0.4	80
75 12 125	040514	1			0.2 - 1.3	1.0	0.6	0.4	80
75 22 125	040538	2			0.2 - 1.3	1.0	0.4	0.4	80
75 32 125	040552	3 / >			0.2 - 1.3	1.0	0.4	0.4	90
75 52 125	040576	5			0.2 - 1.0	0.6	0.5	0.3	85

KNIPEX Electronics Diagonal Cutters are suitable for work in confined areas due to their slim head.

Their precise cutting edges can also cut thin piano wire.



76 Electro-Mechanics' Diagonal Cutters



- DIN ISO 5749 ▶ with precision cutting edges for soft, hard and piano wire; also suitable for thin copper wire
 - cutting edges additionally induction hardened, cutting edge hardness approx. 63 HRC
 - ► lap joint
 - Vanadium electric steel, oil-hardened and tempered

Style 0:

▶ with bevel

Style 1:

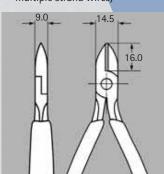
- with bevel
- ► low-friction double spring for gentle and even opening

Style 2:

- without bevel for flush cutting of soft wires
- ► low-friction double spring for gentle and even opening

Style 8:

particularly tapered head with small bevel for work in confined areas (cable harnesses, multiple strand wires)

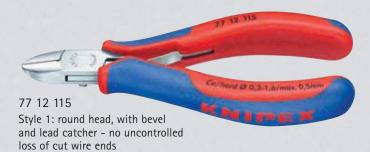


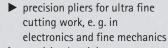
Article-No.	EAN-	Style	Head	Handles	Cutting	Cutting capacities			₫
Length		Code	•				•		
mm	4003773-				ø mm	ømm	ømm	ømm	g
76 01 125	018490	0	polished	plastic coated	0.4 - 2.5	1.8	1.0	0.6	90
76 03 125	018506		chr. pl.	plastic coated	0.4 - 2.5	1.8	1.0	0.6	90
76 05 125	005315		chr. pl.	with two-colour	0.4 - 2.5	1.8	1.0	0.6	115
76 12 125	048015	1 M	polished	dual component handles	0.4 - 2.5	1.8	1.0	0.6	110
76 22 125	048022	2 / www	polished		0.4 - 2.5	-	-	-	110
76 81 125	018544	8 /	polished	plastic coated	0.4 - 1.3	1.0	0.6	-	90

77 Electronics Diagonal Cutters

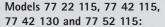








- precision box joint
- low-friction double spring for gentle and even opening
- the polish or mirror polish (only finish 2) together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
- cutting edges additionally induction hardened, cutting edge hardness approx. 62 HRC
- special tool steel, oil-hardened and tempered



cutting edges hardness approx. 57 HRC

Models 77 21 115:

pointed head, without bevel

Models 77 21 130:

round head, without bevel



77 32 115

Style 3: pointed head, with small bevel



77 42 115

Style 4: pointed head, without bevel



Style 5: pointed, flat head, with small bevel



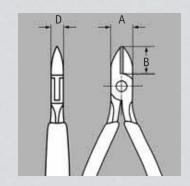
Style 7: pointed mini-head, with small bevel











Article-No.	EAN-	Style	Head	Handles	Dimensions		Cutting ca	pacities		∆'∆	
Length	Code	all pliers with	•	•	В	Α	D			•	
mm	4003773-	ф ww			mm	mm	mm	ømm	ømm	ø mm	g
77 01 <u>115</u>	018568	0	polished	plastic coated	14.0	11.0	7.5	0.3 - 1.6	1.2	0.5	70
130	018575				18.0	15.0	9.5	0.3 - 2.0	1.5	0.8	110
77 02 115	039334		mirror polished	with two-colour	14.0	11.0	7.5	0.3 - 1.6	1.2	0.5	80
130	039341			dual component handles	18.0	15.0	9.5	0.3 - 2.0	1.5	0.8	125
77 11 115	018629	1	polished	plastic coated	14.0	11.0	7.5	0.3 - 1.6	1.2	0.5	70
77 12 115	043768		mirror polished	two-colour dual component handles	14.0	11.0	7.5	0.3 - 1.6	1.2	0.5	80
77 21 <u>115</u>	018650	2	mirror polished	with two-colour	14.0	11.0	7.5	0.3 - 1.3	1.0	-	70
130	018667			dual component handles	18.0	15.0	9.5	0.3 - 1.6	1.3	-	115
77 22 115	043782		mirror polished	with two-colour	14.0	11.0	7.5	0.3 - 1.3	1.0	-	85
130	040446			dual component handles	18.0	15.0	9.5	0.3 - 2.0	1.5	0.5	120
77 32 115	044307	3	mirror polished	two-colour dual component handles	14.0	11.0	7.5	0.3 - 1.3	1.2	0.5	80
77 42 115	039761	4	mirror polished	with two-colour	14.0	11.0	7.5	0.3 - 1.3	1.0	-	85
130	018773			dual component handles	18.0	15.0	9.5	0.3 - 1.6	1.3	-	125
77 52 115	040750	5 🦰	mirror polished	two-colour dual component handles	14.0	11.0	7.5	0.3 - 1.0	0.8	0.5	80
77 72 115	040958	7	mirror polished	two-colour dual component handles	10.5	9.5	6.5	0.3 - 0.8	_	_	70

77 Electronics Diagonal Cutters ESD



77 12 115 ESD

Style 1: round head, with bevel and lead catcher - no uncontrolled loss of cut wire ends



77 12 115





Style 2: round head, without bevel

77 32 115 ESD

Style 3: pointed head, with small bevel



SE 0.3-1-3/1.0

Style 4: pointed head, without bevel

 precision pliers for ultra fine cutting work, e. g. in electronics and fine mechanics

- electrically discharging versiondissipative
- precision box joint
- low-friction double spring for gentle and even opening
- the mirror polish together with a fine film of oil offer the best possible rust protection - no circuit faults caused by peeling chrome from plated tools
- cutting edges additionally induction hardened, cutting edge hardness approx. 62 HRC
- with two-colour dual component handles, black/grey
- special tool steel, oil-hardened and tempered

Models 77 22 115 ESD, 77 42 115 ESD and 77 52 115 ESD:

cutting edges hardness approx. 57 HRC

00 20 17

77 52 115 ESD

with small bevel

Style 5: pointed, flat head,



ESD

When using pliers on components endangered by electrostatic discharge (ESDS – electro static discharge sensitive devices) relevant regulations and standards

(e. g. IEC TR 61 340-5, DIN EN 61 340-5, SP Method 2472) require a controlled discharge of electric energy through the handles of such pliers.

The KNIPEX Electronics
Pliers in ESD version
discharge the electrostatic
energy correspondingly
slowly and under control
to protect endangered
components.





Style 7: pointed mini-head, with small bevel

Article-No.	EAN-	Style	Head	Handles	Dime	nsions	;	Cutting	capac	cities	Δ'Δ
Length	Code	all pliers with	•	•	В	Α	D				
mm	4003773-	. 🕸 🗪			mm	mm	mm	ømm	ømm	ø mm	g
77 02 115 ESD	025092	0	mirror	with two-colour	14.0	11.0	7.5	0.3 - 1.6	1.2	0.5	80
77 12 115 ESD	025108	1	polished	dual component handles	14.0	11.0	7.5	0.3 - 1.6	1.2	0.5	75
77 22 115 ESD	025115	2			14.0	11.0	7.5	0.3 - 1.3	1.0	-	85
77 32 115 ESD	025122	3			14.0	11.0	7.5	0.3 - 1.3	1.2	0.5	80
77 42 115 ESD	031901	4			14.0	11.0	7.5	0.3 - 1.3	1.0	-	85
77 52 115 ESD	025139	5			14.0	11.5	7.5	0.3 - 1.0	0.8	0.5	80
77 72 115 ESD	024330	7			10.5	9.5	6.5	0.3 - 0.8	_	_	70

78 Electronics Super-Knips



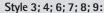
- precision pliers for ultra fine cutting work, e. g. in electronics and fine mechanics
- precision shaped tips also cut close sitting wire from 0.2 mm dia.
- joint with stainless steel rivet
- extremely smooth movement for minimum operator fatigue
- with opening spring and restricted opening



- ► INOX stainless steel
- cutting edge hardness approx. 54 HRC

Style 2:

▶ with 60° angled blades



special tool steel

Style 3; 4:

cutting edge hardness approx. 60 HRC



with lead catcher - no uncontrolled loss of cut wire ends

Style 6; 7; 8; 9:

 cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC

Style 0; 1; 2; 4; 4; 6; 7:

precision-ground cutting edges without bevel for flush cutting

Style 8; 9:

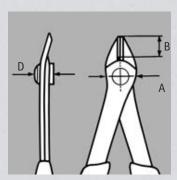
 precision ground cutting edges with very small bevel suitable also for hard wire

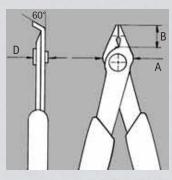


KNIPEX Super-Knips have precision ground cutting edges for clean, flush cutting. The very smooth joint and the opening spring provide high operation comfort.



Angled blades for clean cut also in confined areas







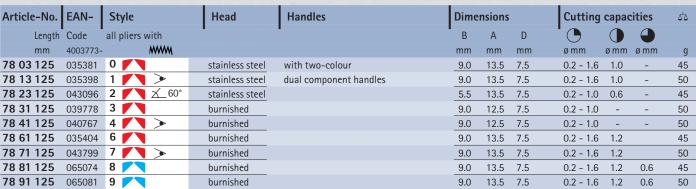


78 61/81 125

=

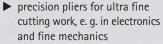
Modell 78 61 125:

also suitable for cutting glass fibre cables (fibre optics)



78 Electronics Super-Knips ESD





- electrically discharging versiondissipative
- precision-ground cutting edges without bevel for flush cutting
- precision shaped tips also cut close sitting wire from 0.2 mm dia.
- ▶ joint with stainless steel rivet
- extremely smooth movement for minimum operator fatigue
- with opening spring and restricted opening
- with two-colour dual component handles black/grey



- ► INOX stainless steel
- cutting edge hardness approx. 54 HRC

Style 1; 7:

 with lead catcher - no uncontrolled loss of cut wire ends

Style 6; 7:

- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- special tool steel, burnished

Special

KNIPEX Super-Knips have precision ground cutting edges for clean, flush cutting. The very smooth joint and the opening spring provide high operation comfort.



ESD

When using pliers on components endangered by electrostatic discharge (ESDS – electro static discharge sensitive devices) relevant regulations and standards

(e. g. IEC TR 61 340-5, DIN EN 61 340-5, SP Method 2472) require a controlled discharge of electric energy through the handles of such pliers.

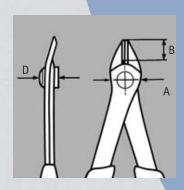
The KNIPEX Electronics
Pliers in ESD version
discharge the electrostatic
energy correspondingly
slowly and under control
to protect endangered
components.



78 13 125 ESD

78 61 125 ESD

Article-No.	EAN-	Style	Head	Handles	Dime	nsions		Cutting	g capa	cities	47
Length	Code	all pliers with	•	•	В	Α	D	. •		9	
mm	4003773	- MMM			mm	mm	mm	ø mm	ømm	ø mm	g
78 03 125 ESD	025146	0	stainless steel	with two-colour	9.0	13.5	7.5	0.2 - 1.6	1.0	-	45
78 13 125 ESD	025153	1 >	stainless steel	dual component handles	9.0	13.5	7.5	0.2 - 1.6	1.0	-	45
78 61 125 ESD	025184	6	burnished		9.0	13.5	7.5	0.2 - 1.6	1.2	0.6	45
78 71 125 ESD	025191	7 >	burnished		9.0	13.5	7.5	0.2 - 1.6	1.2	0.6	50



79 Precision Electronics Diagonal Cutters,

with ground head and screw joint

DIN ISO 9654











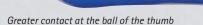






KNIPEX

79 52/62 125



- ► the assortment for highest standard of performance and results
- precision pliers for ultra fine cutting work, e. g. in electronics and fine mechanics
- precisely ground, sharp cutting edges with very small bevel for exact cutting on delicate components; also without bevel for flush cutting
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- joint with screw: precise, zero-backlash operation of pliers
- precisely finished joint surfaces for smooth, low friction movement along the complete opening range
- low-friction double spring for gentle and even opening
- ▶ non-reflective finish
- low weight
- ergonomically shaped, twocolour dual component handles; blue/grey
- high quality ball bearing steel, forged

Model 79 02 120:

mini-head, with very small bevel

Model 79 02 125:

round head with very small bevel

Model 79 22 120:

▶ mini-head, without bevel

Model 79 22 125:

round head, without bevel

Model 79 32 125:

pointed head, with very small bevel

Model 79 42 125:

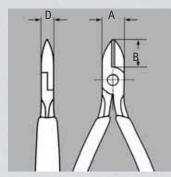
pointed head, without bevel



In the design of KNIPEX Electronics Pliers for gripping and cutting ergonomic criteria have been given particular attention. The ergonomics of the twocolour dual component handles were optimised to suit the motion sequence during precision work. The shape and material chosen allow a secure grip and fatigue reduced work. The strain on the hand is distributed over a larger surface and reduces pressure accordingly. The user still retains the sense for the work on the workpiece.



79 22 120: mini-head with bevel for flush cutting



Article-N	o. EAN-	Style	Head	Handles	Dim	Dimensions		Cutting	Cutting capacities		
Leng	gth Code	all pliers with	•	•	• B	Α	D	. •			
mm	4003773	- W M			mm	mm	mm	ø mm	ømm	ømm	g
79 02 120	061403	mini-head	polished	with two-colour	6.5	9.0	6.5	0.2 - 1.0	0.55	0.3	60
		0		dual component handles							
79 02 12	5 061281	head round			10.0	11.0	6.5	0.2 - 1.5	0.80	0.5	60
79 22 120	061427	mini-head	polished	with two-colour	6.5	9.0	6.5	0.1 - 0.8	0.40	-	60
		2		dual component handles							
79 22 12	5 061342	head round			10.0	11.0	6.5	0.1 - 1.2	0.65	-	60
79 32 125	5 061366	3	polished	with two-colour	11.0	11.0	6.5	0.2 - 1.3	0.70	0.4	60
79 52 125	5 065135	head pointed		dual component handles							
79 42 12	5 061380	4	polished	with two-colour	11.0	11.0	6.5	0.1 - 1.0	0.55	-	60
79 62 125	5 065142	head pointed		dual component handles							

79 Precision Electronics Side Cutters ESD,

with ground head and screw joint

DIN ISO 9654







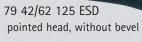
79 02 120 ESD mini-head, with very small bevel





79 22 125 ESD round head, without bevel







79 52/62 125 ESD



00 20 16 P ESD

Greater contact at the ball of the thumb

- ► the assortment for highest standard of performance and results
- precision pliers for ultra fine cutting work, e. g. in electronics and fine mechanics
- precisely ground, sharp cutting edges with very small bevel for exact cutting on delicate components; also without bevel for flush cutting
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- electrically discharging versiondissipative
- joint with screw: precise, zerobacklash operation of pliers
- precisely finished joint surfaces for smooth, low friction movement along the complete opening range
- low-friction double spring for gentle and even opening
- ▶ non-reflective finish
- low weight
- ergonomically shaped, twocolour dual component ESD handles, black/grey
- high quality ball bearing steel, forged

Model 79 02 120 ESD:

mini-head, with very small bevel

Model 79 02 125 ESD:

round head with very small bevel

Model 79 22 120 ESD:

mini-head, without bevel

Model 79 22 125 ESD:

round head, without bevel

Model 79 32 125 ESD:

pointed head, with very small bevel

Model 79 42 125 ESD:

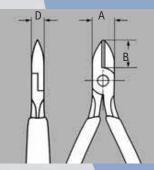
pointed head, without bevel



When using pliers on components endangered by electrostatic discharge (ESDS - electro static discharge sensitive devices) relevant regulations and standards (e. g. IEC TR 61340-5, DIN EN 61340-5, SP Method 2472) require a controlled discharge of electric energy through the handles of such pliers. The KNIPEX Electronics Pliers in ESD version discharge the electrostatic energy correspondingly slowly and under control to protect endangered components.



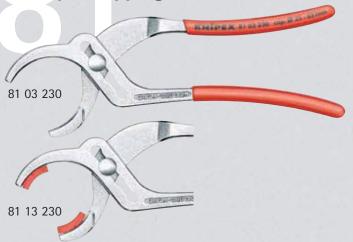
79 32 125 ESD: pointed head for optimum access in confined areas for the removal of components



Article-No.	EAN-	Style	Head Handles Dimensions				Cutting	47			
Length	Code	all pliers with	•		В	Α	D			•	
mm	4003773-	WWM			mm	mm	mm	ømm	ømm	ømm	g
79 02 120 ESD	061595	mini-head	polished	with two-colour	6.5	9.0	6.5	0.2 - 1.0	0.55	0.3	60
		0		dual component handles							
79 02 125 ESD	061519	head round			10.0	11.0	6.5	0.2 - 1.5	0.80	0.5	60
79 22 120 ESD	061618	mini-head	polished	with two-colour	6.5	9.0	6.5	0.1 - 0.8	0.40	-	60
		2		dual component handles							
79 22 125 ESD	061533	head round			10.0	11.0	6.5	0.1 - 1.2	0.65	-	60
79 32 125 ESD	061557	3	polished	with two-colour	11.0	11.0	6.5	0.2 - 1.3	0.70	0.4	60
79 52 125 ESD	065159	head pointed		dual component handles							
79 42 125 ESD	061571	4	polished	with two-colour	11.0	11.0	6.5	0.1 - 1.0	0.55	-	60
79 62 125 ESD	065166	head pointed		dual component handles							



81 Pipe Gripping Pliers



- ▶ ideal for tightening and releasing plastic pipe joints, round union nuts, etc. from 25 up to 65 mm dia.
- with serrated gripping jaws
- ► 4-position adjustable slip joint
- ► Chrome Vanadium electric steel, oil-hardened and tempered

Model 81 13 230:

• with plastic jaws for careful installation up to 60 mm dia.

Bestell-Nr.	EAN-	Head	Handles	Working capacities	47
Length	Code				
mm	4003773-			ø mm	g
81 03 230	018957	chr. plated	plastic coated	25 - 65	290
81 13 230	050117	chr. plated	plastic coated	25 - 60	295
81 19 230	050124	2 sets of plas	tic jaws for 81 13 230		



Easy tightening and releasing of plastic pipe joints

82 Angle Nose Battery Pliers



- ► for nuts and screws up to max. 14 mm width across flats
- serrated gripping surfaces
- ► Chrome Vanadium electric steel, oil-hardened and tempered

82 51 200

Article-No.	EAN-	Head	Handles	47
Length	Code	•		
mm	4003773-			g
82 51 200	015079	polished	plastic coated	215

84 Cycle Pliers



- for very narrow screw connections
- special tool steel, oil-hardened and tempered

Model 84 11 200:

straight head

04 11 200							
Article-No.	EAN-	Style	Head	Handles	Head	Recess	Δ [†] Δ
Length	Code				thickness		
mm	4003773-				mm	ø mm	g
84 11 200	051923	1 straight	polished	plastic coated	3.5	6/10	170
84 21 200	051930	2 // 	polished	plastic coated	3.5	6/10	170

Model 84 21 200:

► 20° angled head



Angled head for work in confined areas

83 Pipe Wrenches 90°



83 10 015

- N 5234 ► Swedish pattern
 - ▶ 90° angled jaws
 - jaws with offset teeth in opposite direction
 - ► teeth additionally induction hardened
 - ► T-beam handle design
 - captive adjusting nut
- red powder coated, jaws bright ground
- **▶** forged
- Chrome Vanadium steel, oil-hardened and tempered





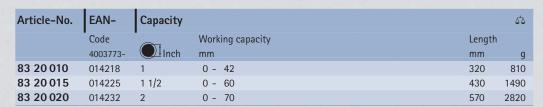
Article-No. EAN-Capacity ₽ Code Working capacity Length Inch 4003773mm mm g 83 10 010 014188 0 - 42 785 310 83 10 015 014195 1 1/2 0 - 60 420 1425 83 10 020 014201 2 0 - 70 560 2590 83 10 030 022329 3 10 - 105 650 3450 83 10 040 022336 4 10 - 130 750 4910

83 Pipe Wrenches 45°



83 20 015

- Swedish pattern
- ▶ 45° angled jaws
- jaws with offset teeth in opposite direction
- teeth additionally induction hardened
- ► T-beam handle design
- ► captive adjusting nut
- red powder coated, jaws bright ground
 - forged
- Chrome Vanadium steel, oil-hardened and tempered







83 Pipe Wrenches S-Type



83 30 015

- Slim, S-type jaw design,45° angled jaws
 - jaws with offset teeth in opposite direction
 - teeth additionally induction hardened
 - three-point gripping on pipes, self-locking
- ► T-beam handle design
- captive adjusting nut
- red powder coated, jaws bright ground
- ▶ forged
- Chrome Vanadium steel, oil-hardened and tempered





Article-No.	EAN-	Capacity			2,7
	Code		Working capacity	Length	
	4003773-	Inch	mm	mm	g
83 30 005	025221	1/2	0 - 35	245	500
83 30 010	014249	1	0 - 42	320	870
83 30 015	014256	1 1/2	0 - 60	420	1570
83 30 020	014263	2	10 - 70	540	2540
83 30 030	014164	3	10 - 120	680	4295

$85~SmartGrip^{\text{TM}}$, the Water Pump Pliers with automatic adjustment

patented DIN ISO 8976

85 01 250

- self-controlled adjustment on the workpiece simply by squeezing the handles - ideal for frequent changeover to workpieces of different size
- one-hand operation for left and right handed people
- ► locking lever for space saving transport with reliable closed handles
- fine adjustment for favourable handle width

- slim dimensions for good access to the workpiece
- ➤ capacity: for nuts 10 36 mm (1 3/8") a/f; for pipes 1/8" 1 1/4"
- box-joint design: high stability because of double guide and secure catching of the hinge holt
- self-locking on pipes and nuts: no slipping on the workpiece and low handforce required
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping
- ► favourable lever action: optimum transmission of force
- guard prevents operators' fingers being pinched
- ► Chrome Vanadium electric steel, forged, oil-hardened and tempered



The adjustment procedure to match with the workpiece acts self-controlled with the SmartGrip™. Position the pliers, press handles - ready!





Automatic adjustment: not time-consuming trial and error-adjusting of the correct opening size in case of differently sized workpieces (e. g. the red highlighted nuts and threaded connections). Everything done with a snatch



Locking lever for space saving transport with reliable closed handles

EAN-

Code

4003773-

061304

Head

polished

Handles

with non-slip

plastic coating

Article-No.

Lenth

mm 85 01 250



Slim dimensions for good access to the workpiece using one-hand operation



87 KNIPEX-"Cobra" XL/XXL, Pipe Wrenches and Water Pump Pliers

patented



87 01 560



87 01 400

- ► Pipe Wrench and Water Pump Plier in one tool
- self-locking on pipes and nuts: no slipping on the workpiece; low handforce required
- ► fast and firm adjustment directly on the workpiece
- ▶ no unintentional shifting
- ▶ non-slip joint
- ▶ fine adjustment
- ▶ optimum lever action
- can be used as a wrench in a lot of situations
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping
- ► Chrome Vanadium electric steel, oil-hardened and tempered

Model 87 01 400:

➤ capacity of jaws for pipes up to 3 1/2" at a total length of a 1 1/2" Pipe Wrench

"Cobra XXL" - Water Pump Plier and Pipe Wrench in one tool. The optimized jaw design grips nuts and pipes up to 4 1/2" with a weight and size of a 2" Pipe Wrench. Besides the tremendous

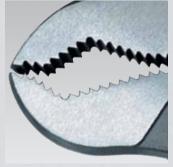
- ➤ 20% less weight than a 1 1/2" Pipe Wrench
- ▶ 27 adjustment positions

Model 87 01 560:

- ➤ capacity of jaws for pipes up to 4 1/2" at a total length of a 2" Pipe Wrench
- ► 40% less weight than comparable Pipe Wrenches
- ▶ 20 adjustment positions



Fine adjustment by pushing a button: quick and comfortable



Optimized shape of jaws for gripping pipes and nuts



87 01 560: Jaw-capacity for pipes up to 4 1/2" at a weight and length of a 2" Pipe Wrench



Fast and firm adjustment directly on the workpiece

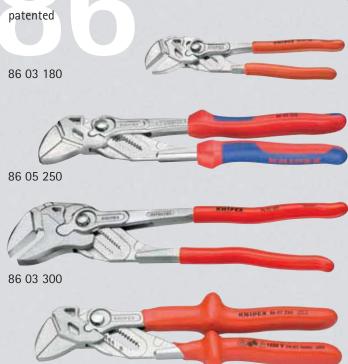


Self-locking on pipes and nuts. No slipping on the workpiece and less handforce required

Article-No.	EAN-	Head	Handles	W	orking capa	cities	47
Lenth	Code			'fo	r pipes	for nuts	
mm	4003773-)_Ĵ Inch	mm (acro	ss flats) g
87 01 400	005636	polished	plastic coated	3 1	1/2	95	1190
87 01 560	044321			4 ′	1/2	120	2760

For the complete "Cobra"-Range from 150 - 560 mm see page 78

86 Pliers Wrenches, Pliers and Wrench in a single tool



Compressive strain areas when force is applied on the Pliers Wrench 86 03 250 and a conventional open end wrench

Pliers Wrench: zero backlash under pressure

86 07 250

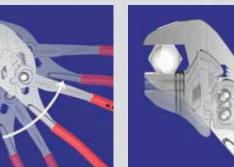
86 07 250

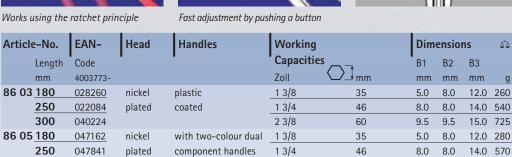
065067

nickel

plated

Conventional open end wrench: edge pressure causes surface damage





46

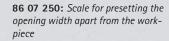
plastic dipped insulated 13/4

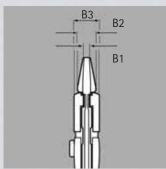
♠ ★ 1000 V, VDE-tested

- excellent for gripping, holding, pressing and bending workpieces
- ► for careful installation of finished-surface components
- zero backlash jaw surface pressure prevents damage to edges of sensitive components
- ► fast adjustment by pushing a button directly on the workpiece
- no unintentional shift of the gripping jaws and no slipping of the joint
- replaces a complete set of spanners
- parallel jaws allow infinitely variable gripping of all widths to the specified maximum size
- the action of the jaws allows screwed connections to be tightened and released quickly using the ratchet principle
- lever transmission greater than 10 - 1 for strong gripping power
- also for tile breaking

Model 86 03/05 180:

 with narrow gripping jaws - for fastening/loosening situations requiring a slim tool





8.0 8.0

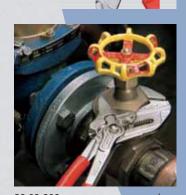
14.0 600

Special

The patented Pliers Wrench is a multi functional fastening, gripping and holding tool with fast adjustment pushing a button. The high lever ratio, parallel jaws without profile and infinitely variable adjustment guarantee a secure and smooth gripping of the workpiece free from any backlash.



Working on plated fittings without damage of the surface



86 03 300: enormous pressure and a capacity up to 60 mm/ 2 3/8" allows application even on large size nuts

87 KNIPEX-"Cobra", the HiTech Water Pump Pliers



- fast adjustment directly on the workpiece: fast and comfortable handling
- fine adjustment: ensures optimum adjustment to differently sized workpieces and user-friendly handle position;

87 01 150: 11 adjustment positions 87 01 180: 11 adjustment positions 87 01 250: 25 adjustment positions 87 01 300: 14 adjustment positions 87 01 400: 27 adjustment positions 87 01 560: 20 adjustment positions

- secure catching of the hinge bolt: no unintentional shifting
- box-joint design: high stability because of double guide
- self-locking on pipes and nuts: no slipping on the workpiece and low handforce required
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping

Special

KNIPEX-"Cobra" - the HiTech Water Pump Pliers.
No more time-consuming test-adjusting of the correct opening size. Just position the upper jaw to the workpiece, push button and move close the lower jaw, ingeniously simple.

- ▶ one-hand adjustment
- guard prevents operators' fingers being pinched
- ► favourable lever action: optimum transmission of force
- Chrome Vanadium electric steel, oil-hardened and tempered

Model 87 01 150:

► Mini-"Cobra", length only 150 mm



Self-locking on pipes and nuts. No slipping on the workpiece and less handforce required



Fine adjustment by pushing a button: fast and comfortable



Fast and firm adjustment directly on the workpiece





Operation on pneumatic pipes

87 KNIPEX-"Cobra..matic", Water Pump Pliers for one-hand operation

DIN ISO 8976

- ▶ the proved "Cobra" with automatic adjustment
- the plier can be opened and adjusted directly at the workpiece with one hand
- ► the "Cobra..matic" closes when pushing a button
- ▶ the integrated spring of the automatic adjustment is shielded in the handles
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping
- ► Chrome Vanadium electric steel, oil-hardened and tempered

87 11 250

patented

Article-No.	EAN-	Head	Handles	Capacities		47
Length	Code			for pipes	for <u>n</u> uts	
mm	4003773-			O_Ĵ Inch		s) g
87 11 180	026921	polished	with non-slip plastic coating	1 1/4	30	170
250	022107			1 1/2	36	300
87 19 180	026938	spare spring				
250	022640					

87 Multiple Slip Joint Spanner

patented



87 41 250



Self-locking: no slip on workpieces; less effort required



as the second spanner for tightening locknuts



Multiple Slip Joint Spanner Working on tight nuts with rounded edges



Fine adjustment by pushing a button: fast and comfortable

- ► for hexagonal screws and nuts width across flats 10 - 32 mm (3/8" - 1 1/4"); self-locking in the range of 17 - 32 mm (11/16" - 1 1/4"); no slip on workpieces; less effort required
- replaces a complete set of spanners
- perfect fitting grip on bolt heads and nuts with metric or imperial sizes; no rounding of gripping surfaces
- ► the plier-type gripping movement of the jaws allows threaded connections to be tightened and released quickly using the ratchet principle
- ideal for tightening locknuts
- secure and tight grabbing of bolt heads with rounded edges, rusted nuts or heavily coated workpieces
- secure catch of the hinge bolt: no unintentional shifting
- box-joint design: high stability because of double quide
- quard prevents operators' fingers being pinched
- ergonomic handle design with non-slip plastic coating for comfortable grip particularly with large and tight nuts

The new KNIPEX Multiple Slip Joint Spanner is a combination tool that offers the convenience of the comfortable push-button adjustment on the workpiece and the function of an adjustable spanner. Zero backlash pressure of the jaws avoids slipping on the threaded connection or a rounding effect on the edges. Even rounded edges and heavily coated workpieces that do not offer a convenient gripping surface to conventional wrenches, can be loosened with the exceptionally powerful gripping jaws of the Multiple Slip Joint Spanner.

- one-hand fine adjustment by pushing a button with 15 adjustment positions directly on the workpiece for perfect grip on different sized workpieces and a favourable position of the hand
- Chrome Vanadium steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Capacities		47
Length	Code			•		
mm	4003773-			mm	Inch	g
87 41 250	054566	polished	with non-slip plastic coating	10 - 32	3/8"-1 1/4"	315

87 KNIPEX-"Cobra" ES, the Extra Slim Water Pump Pliers

patented **DIN ISO 8976**



87 51 250

- ► particularly good access to the workpiece due to very slim construction of head and joint area
- long, narrow jaws
- ▶ ideal for service and maintenance, equipment repair, automotive and general industry
- one-hand fine adjustment by pushing a button with 19 adjustment positions directly on the workpiece for perfect grip on different sized workpieces
- and a favourable position of the hand
- secure catching of the hinge bolt: no unintentional shifting
- box-joint design: high stability because of double guide
- firm grip also on flat material due to three-point rest
- self-locking on pipes and nuts: no slipping on the workpiece and low handforce required
- ▶ gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping

- ► favourable lever action: optimum transmission of force
- quard prevents operators' fingers being pinched
- ► Chrome Vanadium electric steel, oil-hardened and tempered



Subject to the increasing compactness of components and machines the workspace becomes more confined. However, the requirements on the gripping force and capacity of tools on the other hand do not decrease. KNIPEX-"Cobra" ES allows powerful gripping in confined areas.



Optimum access to the workpiece. Ideal for service and maintenance, equipment repair, automotive and general industry



Fine adjustment by pushing a button: fast and comfortable



head and joint area (compared to conventional water pump pliers)

Lenth Code					
LCITCH COUC			for pipes	for nuts	
mm 4003773-			Inch	(across flats)	g
87 51 250 061267	polished	with non-slip	1 1/4"	42 mm	325
		plastic coating			



88 KNIPEX-"Alligator", Water Pump Pliers





88 01 250



88 02 250





- box-joint design: high stability because of double guide
- self-locking on pipes and nuts: no slipping on the workpiece; low handforce required
- guard prevents operators' fingers being pinched
- favourable lever action: optimum transmission of force
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping
- ► Chrome Vanadium electric steel, oil-hardened and tempered





Self-locking on pipes and nuts. No slipping on the workpiece and less handforce required







Optimized shape of jaws for gripping pipes and nuts

Article-No.	EAN-	Head	Handles	Capacities		47
Length	Code	1		for pipes	for nuts	
mm	4003773-			O_Ĵ Inch	mm (ac	ross flats) g
88 00 250	019176	polished	red lacquered	1 1/2	36	300
88 01 180	034445	polished	with non-slip plastic coating	1 1/4	30	185
250	013341			1 1/2	36	315
300	013358			2	46	505
88 02 180	044222	polished	with two-colour	1 1/4	30	215
250	019282		dual component handles	1 1/2	36	355
300	029151			2	46	555
88 03 180	042860	chrome	with non-slip plastic coating	1 1/4	30	185
250	005742	plated		1 1/2	36	315
300	019312			2	46	505
88 05 180	060130	chrome	with two-colour	1 1/4	30	215
250	035497	plated	dual component handles	1 1/2	36	355
300	042389			2	46	555
88 06 250	039303	chrome	insulated with two-colours	1 1/2	36	370
		plated	dual component handles 企 A 1000 V , VDE-tested			
88 07 250	019343	chrome	plastic dipped insulated	1 1/2	36	415
300	022350	plated	🏤 🖨 🛕 1000 V, VDE-tested	2	46	635

89 Water Pump Pliers with groove joint

DIN ISO 8976



89 01 250



89 05 250

- easy, convenient engagement in 5 different positions due to milled swivel
- ▶ non-slip joint
- can be used as a wrench in a lot of situations
- all strain removed from the joint screw, hence no wear on pivot
- guard prevents operators' fingers being pinched
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC for tool length 250 mm: low wear for secure grip

 Chrome Vanadium electric steel, oil-hardened and tempered

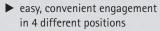
Model 89 .. 250:

self-locking on pipes and nuts: no slipping on the workpiece and low handforce required

Article-No.	EAN-	Head	Handles	Capacities		47
Length	Code	•		for pipes	for nuts	
mm	4003773-			Inch	mm (across flats	s) g
89 01 <u>200</u>	013327	polished	plastic coated	1 1/4	30	230
250	013334			1 5/16	36	335
89 03 <u>200</u>	019367	chrome	plastic coated	1 1/4	30	230
250	015086	plated		1 5/16	36	335
89 04 250	005841	chr. plated	chrome plated	1 5/16	36	325
89 05 200	039310	chrome	with two-colour	1 1/4	30	260
250	043836	plated	dual component handles	1 5/16	36	380

90 Small Water Pump Pliers with groove joint

DIN ISO 8976



- ▶ non-slip joint
- all strain removed from the joint screw, hence no wear on nivot
- forged from Chrome Vanadium electric steel, oil-hardened and tempered



Article-No.	EAN-	Head	Handles	Capacities		44
Length	Code			for pipes	for nuts	
mm	4003773-			O_Ĵømm	mm (across flats)) g
90 01 125	013310	polished	plastic coated	17	14	100
90 03 125	019374	chr. plated	plastic coated	17	14	100

90 Pipe Cutter for composite pipes and protective tubes



90 25 20







Composite pipe: to be cut with the rear cutter

- ► for cutting composite pipes with a diameter of 12.0 25.0 mm and for cutting flexible protective tubes with a diameter of 18.0 35.0 mm without damaging the pipe inside
- easily exchangeable blades
- a calibration arbor can be fitted, for example for Geberit composite pipes with 11.5 and 15.0 mm dia.
- high strength special grade steel, oil-hardened and tempered



Clean cut of protective tubes 18 – 35 mm dia.



Composite pipes of 12 – 25 mm dia. are cut cleanly and without deformation

Article-No. Handles **Cutting capacities** △ EAN-Head Code composite pipes protective pipes Length 4003773ø mm mm ø mm g 90 25 20 046004 galvanized with two-colour dual 12 - 25 18 - 35 210 325 component handles 90 29 01 031932 spare blade for composite pipes 90 29 02 031949 spare blades for protective tubes calibration arbor for Geberit pipes, 11.5 and 15.0 mm dia. 90 29 15 031956

90 Pipe Cutter for composite and plastic pipes



90 25 40





- ► for cutting thick walled plastic and composite pipes of 26.0 40.0 mm dia.
- cuts pipes according to the ratchet principle in several strokes
- moveable pipe support positions pipes of various diameters correctly for a rectangular cut
- easily exchangeable blades
- high strength special grade steel, oil-hardened and tempered



Clean cut of thick walled plastic and composite pipes



Not suitable for thin walled plastic pipes

Article-No.	EAN-	Head	Handles	Cutting capacities		Δ'Δ
	Code				Length	
	4003773-			ø mm	mm	g
90 25 40	045182	galvanized	with two-colour dual	26 – 40	210	465
			component handles			
90 29 40	045199	spare blade				

90 Punch Lock Riveters

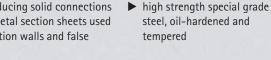


90 41 340

90 42 250

1	Article-No.	EAN-	Head	Handles	Capacity	47
	Length	Code			•	
	mm	4003773-			mm	g
	90 41 340	028055	burnished	plastic coated	max 1.2	900
	90 42 250	047865	burnished	with plastic handles	(2 x 0.6)	690
	90 49 340	028079	spare pund	ch for 90 41 340		
	90 49 340 M	028499	spare die f	or 90 41 340		

- ► for producing solid connections of all metal section sheets used in partition walls and false ceilings
- ► for U- and C-shaped sections with max 1.2 mm metal $(2 \times 0.6 \text{ mm})$
- ► minimum handforce required due to optimum lever transmission



Model 90 41 340:

► for two-hand operation

Model 90 42 250:

► for one-hand operation



Setting the plier for connection of two metal section sheets





The sheet projections are bent



The punching tool is pressed through the metal section sheets



Completed sheet connection



Article-No.	EAN-	Head	Handles	Δ [†] Δ
Length	Code	•	•	
mm	4003773-			g
90 55 280	026730	nickel plated	with plastic handles	560
90 59 280	027355	spare blade		

- ► for cutting iron, copper or aluminium plate up to max. 1.2 mm thickness, plastic up to max. 2.0 mm thickness
- materials are cut without deformation
- work needed on the cut profile
- clean cut edges no additional

90 55 280: Notching and chip breaking in one operation

- with chip breaker
- easy handling
- ► high strength special steel, particularly stressed parts oil-hardened and tempered



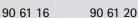
Notching without chip breaking

90 Notching Pliers



29





- special pliers for notching out recesses in plastic ledges and casing boxes for electric and sanitary installation
- notches can be enlarged by initial and final cut
- clean cut edges no additional work needed on the cut profile
- high cutting performance with little handforce due to optimum lever transmission
- easy handling
- with opening spring and restricted opening
- cutter head: special tool steel, oil-hardened and tempered

Special

The KNIPEX Notching Pliers produces the most common notches in plastic ledges and cable ducts in a simple, fast and clean way.

No time-consuming sawing out or nibbling and no additional work required.



Clean cut profile requires no additional work

ArticleNo.	EAN-	Head	Handles	Capacity		7.7
	Code	•		•	Length	
	4003773-				mm	g
90 61 16	051947	burnished	with plastic handles	∏ 16 x 32 mm	250	405
90 61 20	051954	burnished	with plastic handles	□ 20 x 29 mm	250	415

90 Revolving Punch Pliers



- for punching holes in leather, textiles and plastic material
- with six interchangeable punches: 2.0/2.5/3.0/3.5/4.0/5.0 mm dia.
- with opening spring and locking lever
- powder-coated for reliable protection against rust
- punched and stamped from high-strength sheet steel







Interchangeable punches

91 Tile Nibbling Pincer, Parrot Beak Pincer



enlarged and edges formed by nibbling ► high grade special tool steel,

▶ predrilled holes in tiles can be

oil-hardened and tempered

91 00 200

Article-No.	EAN-	Head	Handles	₽₽
Length	Code	•		
mm	4003773-			g
91 00 200	013754	polished	black atramentized	165



91 Tile Breaking Pincer



- ► for breaking tiles to a scored
- moveable, self-aligning jaw, rubberlined to protect the tile
- special tool steel

Article-No.	EAN-	Head	Handles	2,7
Length	Code			
mm	4003773-			g
91 11 190	019459	black lacquered	plastic coated	335

91 Glass Breaking Pincer



- ► for breaking glass to a scored
- special tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Jaw width	47
Length	Code	•			
mm	4003773-			mm	g
91 30 180	015093	polished	black atramentized	24.0	265

91 Glass Nibbling Pincers



91 51 160

- for breaking off narrow strips of glass to a scored line
- ► for finishing off glass edges to required profile
- special tool steel, oil-hardened and tempered

Model 91 71 160:

narrow version, with opening spring

Article-No.	EAN-	Style	Head	Handles	Jaw width	47
Length	Code	•	•			
mm	4003773-				mm	g
91 51 160	014355		polished	plastic coated	9.5	155
91 71 160	019565	WWW	polished	plastic coated	4	145

91 Flat Nose Grozing Pliers



91 61 160

- with soft gripping jaws
- ► for trimming glass edges, e. g. when making leaded glass windows
- ► special tool steel

Article-No.	EAN-	Head	Handles	Jaw width	7.7
Length	Code				
mm	4003773-			mm	g
91 61 160	019527	polished	plastic coated	9.5	145

92 Precision Tweezers for Electronics



Precision Tweezers, pointed shape

- ► for fine mounting work
- straight pattern
- smooth gripping surfaces
- particularly slim tips



Model 92 22 04:

- ▶ non-reflective mattfinished
- gripping surfaces mattfinished for optimum grip
- ► Chrome nickel steel: stainless, anti-magnetic (18/10), not temperable, very popular electronics quality

Model 92 22 06:

- ▶ non-reflective mattfinished
- gripping surfaces mattfinished for optimum grip
- ► Chrome nickel steel: stainless, anti-magnetic (18/10), not temperable, very popular electronics quality

Model 92 22 07:

- ▶ non-reflective mattfinished
- stainless, anti-magnetic and acid-proof

Model 92 23 05:

- ► TITANIUM
- electrically conductive
- ▶ lightweight
- non-reflective mattfinished
- stainless, anti-magnetic and acid-proof

Model 92 24 01:

mirror finish nickel plated and polished

Precision Tweezers, needle-pointed shape

- ► for ultra fine mounting work
- extra fine tips
- ► smooth gripping surfaces
- ► stainless, anti-magnetic
- ▶ non-reflective mattfinished



Model 92 22 12:

straight pattern

Model 92 22 13:

- American shape, solid
- ► straight pattern
- stainless, anti-magnetic and acid-proof

Model 92 32 29:

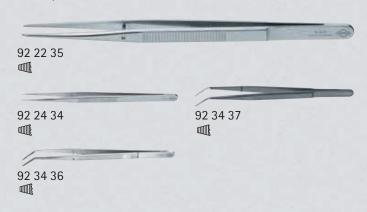
- sickle-shaped tips
- ► Chrome nickel steel: stainless, anti-magnetic (18/10), not temperable, very popular electronics quality
- gripping surfaces mattfinished for optimum grip

Model 92 34 28:

bent tips

Precision Tweezers, with dowel pin, pointed shape

- ▶ universally applicable
- narrow tips
- gripping surfaces with fine transverse serration
- chequered handles



Model 92 22 35:

- ► straight pattern
- ► non-reflective mattfinished
- stainless, anti-magnetic and acid-proof

Model 92 24 34:

- ▶ straight pattern
- nickel plated

Model 92 34 36:

- ▶ bent tips
- nickel plated

Model 92 34 37:

- bent tips
- ▶ black non-reflective lacquered

Data Table see page 91

Precision Tweezers, blunt shape

- ▶ universally applicable
- straight pattern
- wide, round tips
- chequered handles



Model 92 44 42:

- ▶ jewellers' tweezers
- round tips, approx. 2 mm wide
- gripping jaws with fine crosswise serration (cross cut)
- nickel plated

Model 92 64 43:

- round tips, approx. 3.0 mm wide
- gripping surfaces with fine transverse serration
- nickel plated

Model 92 64 44:

- round tips, approx. 3.5 mm wide
- gripping surfaces with fine transverse serration
- nickel plated

- rectangular tips, approx.
- transverse serration

Model 92 70 46:

- round tips, approx. 3.5 mm wide
- gripping surfaces with fine transverse serration
- black non-reflective lacquered

Model 92 72 45:

- round tips, approx. 3.5 mm wide
- serrated gripping surfaces
- non-reflective mattfinished
- stainless, anti-magnetic and acid-proof

Precision Tweezers, rectangular blunt



- mounting tweezers
- 0.9 mm wide
- gripping surfaces with fine
- nickel plated

Precision Tweezers, round slim shape



- round tips, approx. 2 mm wide
- smooth gripping surfaces
- stainless, anti-magnetic and acid-proof

Precision Tweezers, for mounting work

- smooth gripping surfaces
- non-reflective mattfinished



*SMD-technology: technique for soldering surface mounted components on printed circuit boards without using holes.

Modell 92 02 53:

- ► for SMD-technology*
- angled tips, width approx. 1 mm
- gripping surfaces mattfinished for optimum grip
- Chrome nickel steel: stainless, anti-magnetic (18/10), not temperable, very popular electronics quality

Model 92 02 54:

- ► for SMD-technology*
- angled tips, width approx. 1 mm
- gripping jaws 3.5 mm wide, for cylindrical components of 0.6 mm dia.
- gripping surfaces mattfinished for optimum grip

► Chrome nickel steel: stainless, anti-magnetic (18/10), not temperable, very popular electronics quality

Model 92 02 55:

- ▶ gripping jaws 3.5 mm wide, for cylindrical components of 0.8 mm dia.
- chequered handles
- ► stainless, anti-magnetic and acid-proof

Model 92 12 52:

- bent tips
- extra strong tips
- stainless, anti-magnetic

92 Precision Tweezers for Electronics



Precision Tweezers ESD





- ► Chrome nickel steel: stainless, anti-magnetic (18/10), not temperable, very popular electronics quality
- ► ESD coating: non-reflective black, with a surface resistance of approx. 105 Ohm
- tips non-reflective brushed
- gripping surfaces mattfinished for optimum grip

Model 92 08 78 ESD:

- ▶ for SMD-technology*
- bent tips
- smooth gripping surfaces

Model 92 08 79 ESD:

- ► shaped to grip horizontal cylindrical components of 1.0 mm dia.
- smooth gripping surfaces
- chequered handles

Model 92 28 69 ESD:

- ► straight pattern
- ▶ strong tip
- smooth gripping surfaces

Model 92 28 70 ESD:

- straight pattern
- ▶ fine tip
- smooth gripping surfaces

Model 92 28 71 ESD:

- needle-pointed tips
- straight pattern
- smooth gripping surfaces

Model 92 28 72 ESD:

- American shape, solid
- ► long tips
- straight pattern
- smooth gripping surfaces

Model 92 38 75 ESD:

- sickle-shaped tips
- smooth gripping surfaces

Model 92 58 74 ESD:

- round tips, approx. 2 mm wide
- straight pattern
- smooth gripping surfaces

Model 92 78 77 ESD:

- round tips, approx. 3.5 mm wide
- straight pattern
- serrated gripping surfaces
- chequered handles

Model 92 88 73 ESD:

- rectangular tips, approx. 0.9 mm wide
- gripping surfaces with fine transverse serration

Precision Tweezers, insulated **☆ 1000 V**

- ► tested according IEC 60900: 2004 A 1000 V



Model 92 27 61:

- ► for ultra fine mounting work
- extra fine tips
- straight pattern
- gripping surfaces mattfinished for optimum grip

Model 92 27 62:

- ► straight pattern
- gripping surfaces with fine transverse serration

Model 92 37 64:

- bent tips
- gripping surfaces with fine transverse serration

Model 92 67 63:

- straight pattern
- serrated gripping surfaces

92 37 64

^{*} SMD-technology: technique for soldering surface mounted components on printed circuit boards without using holes.

Plastic Tweezers



- solid plastic tweezers
- trapezoidal tips, approx. 3.5 mm wide
- serrated gripping surfaces
- chequered handles
 - heat resistant up to approx. 130° C

Cross-Over Tweezers



- universally applicable
- for efficient clamping
- nickel plated

Model 92 94 91:

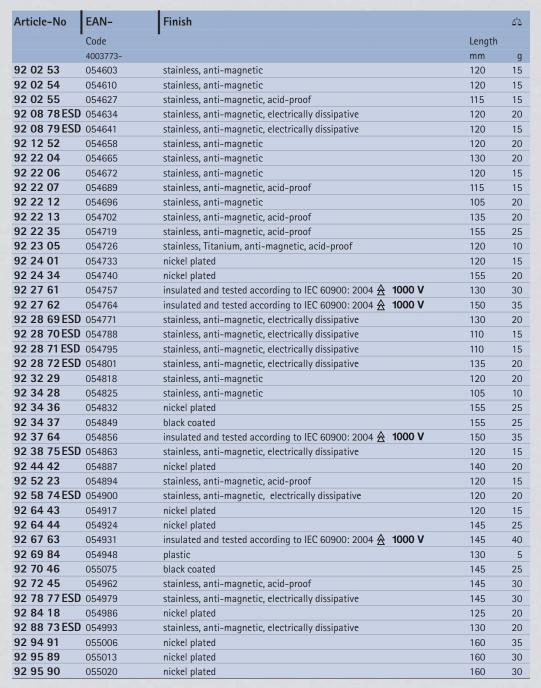
- ▶ trapezoidal tips
- straight pattern
- gripping surfaces with fine
- transverse serration
- chequered handles

Model 92 95 89:

- narrow tips
- straight pattern
- gripping surfaces with fine transverse serration
- handles with plastic attachement

Model 92 95 90:

- narrow tips
- bent tips
- gripping surfaces with fine transverse serration
- handles with plastic attachement







94 Cutter for Plastic Pipes, for the Electrical Installation



► for clean cutting of plastic pipes (e. g. plastic clad pipes) with 6 - 35 mm dia.

► not suitable for cutting cables

- ► blade is replaceable and can be retracted in any position
- ► low force requirement due to special blade geometry and optimum transmission
- minimum operator fatigue due to ergonomic handle design and ratchet blade feed in stages
- die-cast aluminium body, red lacquered

► blade made of tool steel, oil-hardened and tempered

Article-No.	EAN-		Capacity	7,7
Length	Code			
mm	4003773-		ø mm	g
94 10 185	047025		6.0 - 35.0	560
94 19 185	047032	spare blade		50

94 Cutter for Ribbon Cables



- ► for crushing-free cutting of ribbon cable up to 56 mm width
- exchangeable cutting base with fence angle for rectangular cuts
- replaceable, conventional trapezoidal blade
- with opening spring and locking device
- handles and blade mounting made of high-strength special grade steel

Article-No.	EAN-	Head	Handles	Blade length	47
Length	Code	•	•	•	
mm	4003773-				g
94 15 215	046011	chrome plated	plastic coated	56 mm	345
94 19 215	046219	spare blade			50

94 Mitre Shears for plastic and rubber sections



- plastic, rubber and soft timber section; also for ribbon cable up to 56 mm width

 exchangeable cutting base with fence angle for 45°-cuts
 - ► exchangeable cutting base with fence angle for 45°-cuts and markings for 60°-, 75°-and 90°- cuts

► for crushing-free cutting of

- replaceable, conventional trapezoidal blade
- with opening spring and locking device
- handles and blade mounting made of high-strength special grade steel

Article-N	lo.	EAN-	Head	Handles	Blade Length	44
Ler	ngth •	Code	•	•		
mn	n	4003773-				g
94 35 21	5	046028	chrome plated	plastic coated	56 mm	400
94 19 21	5	046219	spare blade			50

95 Vinyl Shears, also for cable ducts

patented



- ► special lever transmission
- new, very effective blade geometry
- ► head burnished, with twocolour dual component handles

Model 95 02 10:

► for plastic material up to approx. 6.0 mm thickness (e. g. PE with 63 Shore)



High cutting performance for vinyl plates up to 6.0 mm thickness



95 02 21

Model 95 02 21: ▶ for cutting and

for cutting and shortening cable ducts, also for plastic material up to 4.0 mm thickness



Blade length 110 mm for cutting wide cable ducts

Article-No.	EAN-	Cutting capacities	Blade length		47
	Code		•	Length	
	4003773-	mm	mm	mm	g
95 02 10	047872	4.0 - 6.0	60	225	460
95 02 21	052128	max. 4.0	110	275	535

95 Shears for KEVLAR® Fibres



- only for cutting fibres of KEVLAR® in optical fibre cables, not recommended for other materials
- precision grinding with serration prevents the fibres from slipping and guarantees a clean cut
- ▶ riveted precision joint, for low-friction movement and smooth and even cutting of the thin KEVLAR® fibres
- hard-chrome plated, ground surface
- user-friendly plastic handles
- body of shears oil-hardened and tempered

Article-No.	EAN-	Head	Handles	7,7
Length	Code			
mm	4003773-			g
95 03 160 SB	043362	chrome plated	plastic coated	80



Precision ground with fine toothing for clean, non-slip (nonskid) cut

95 Combination Shears



- combination shears for cutting cardboard, plastics, aluminium, brass and copper foils
- not suitable for steel wire or iron sheets
- precision ground, hardenedblades
- with opening spring and locking lever
- ▶ with guard
- ► adjustable screw joint
- ▶ blades made of stainless steel
- ▶ oil-hardened and tempered

Model 95 05 185:

- angled shape for easy execution of long cuttings
- ergonomically shaped plastic handles

Article-No.	EAN-	Head	Handles	Δ'Δ
Length	Code			
mm	4003773-			g
95 05 140	019589	bright polished	with plastic handles	50_
185	060277			110
190	019602			120

KEVLAR® is a registered Trademark of E. I. du Pont de Nemours and Company

95 Cable Shears



- not suitable for steel wire and hard drawn copper conductors
- precision ground, hardened blades
- no crushing, slight deformation of the cable only
- ▶ with guard
- adjustable screw joint

Model 95 05 165:

- cable shears for universal use; cuts cables up to 10 mm dia. / 24 mm²
- with opening spring and locking lever
- ▶ blades made of stainless steel
- ▶ oil-hardened and tempered

Model 95 06 230:

- ► for copper conductors single wire up to 16 mm², multiple wire up to 50 mm², fine strand up to 70 mm² and aluminium conductors multiple wire up to 70 mm²
- easy cutting with one-hand operation due to high transmission ratio
- stainless special grade steel, oil hardened and tempered
- ➤ VDE tested according to DIN EN/IEC 60900: 2004

Article-No. EAN-Head Handles **Cutting Capacity** Ճ Code Length mm 4003773ø mm mm² AWG g 95 05 165 019596 bright polished with plastic handles 10 24 3 115 95 06 230 006305 bright polished plastic insulated 16 50 1/0 275 ☆ 1000 V ♠ VDE-tested

95 Cable Shears



- for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and hard drawn copper conductors
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- easy cutting with one-hand operation
- with guard
- adjustable screw joint, self-locking
- forged
- special tool steel, oil-hardned and tempered

Model 95 11/12 165:

universal use for dismantling and stripping



Cut performed with a Diagonal Cutter: high effort required, inaccurate cut, considerable deforming and crushing of the cable



Cut effected with a Cable Shear: easy, clean cut without any deformation of the cable

Article-No.	EAN-	Head	Handles	Cuttin	ıg capac	ity	47
Length	Code	•	•	•			
mm	4003773-			ø mm	mm²	AWG	g
95 11 165	029175	burnished	plastic coated	15	50	1/0	210
95 12 165	029182	burnished	with two-colour	15	50	1/0	245
			dual component handles				
95 16 165	039648	chrome	insulated with two-colour	15	50	1/0	255
		plated	dual component handles				
			A 1000 V A VDE-tested				

95 Cable Shears with twin cutting edge

patented





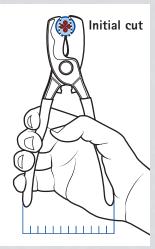


▶ for cutting copper and aluminium cables, single and multiple wire

- not suitable for steel wire and hard drawn copper conductors
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- easy cutting with one-hand operation
- initial and final cut (upper and lower blade) allows cables of up to 20 mm dia. to be cut
- low handforce required due to favourable lever ratio and new blade geometry
- with guard
- adjustable screw joint, self-locking
- forged
- special tool steel, oil-hardened and tempered

KNIPEX Cable Shears with twin cutting edge are designed for cutting cables up to 20 mm dia. Even in case of large cable cross sections handles are always in a favourable position due to initial and final cut.

Article-No.	EAN-	Head	Handles	Cuttin	Cutting capacity		47
Length	Code	•	•	' @			
mm	4003773-			ø mm	mm²	AWG	g
95 11 200	026754	burnished	plastic coated	20	70	2/0	295
95 12 200	047834	burnished	with two-colour	20	70	2/0	345
			dual component handles				
95 16 200	026761	chrome	insulated with two-colour	20	70	2/0	345
		plated	dual component handles				
			A 1000 V A P VDE- tested				
95 17 200	026952	chrome	plastic dipped insulated	20	70	2/0	380
		plated					



Initial cut: using the upper cutting edge, an ergonomic handle opening is guaranteed even in case of large cable diameters



Final cut: if higher handforce is required, an additional cut can be done with the cutting edge profile near the joint. Initial cut with the upper cutting edge - final cut with the lower cutting edge





EAN-

4003773-

026778

026785

Head

polished

polished

Large cutting capacity: max. 27 mm dia./150 mm²

Length

mm

Article-No.

95 11 500

95 17 500

95 21 600

95 Cable Shears	

Handles

with plastic handles

plastic dipped insulated

★ 1000 V

★ VDE-tested

Article-No. EAN-Head Handles **Cutting capacity** Ճ Code Length AWG mm 4003773ø mm mm² g 95 21 600 polished with plastic handles 5/0 2055 025252 27 150 95 27 600 021797 plastic dipped insulated 27 150 5/0 2300 polished A 1000 V A VDE-tested 95 29 600 021803 365 spare cutter head

- for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and wire ropes
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- ► low handforce required due to favourable lever ratio and new blade geometry
- short design, length only 500 mm
- low weight
- with guard
- ▶ adjustable screw joint

Cutting capacity

150

150

► for cutting copper and

and multiple wire

and wire ropes

blades

aluminium cables, single

not suitable for steel wire

precision ground, hardened

crushing and deformation favourable transmission ratio

due to double lever

clean and smooth cut without

ø mm mm²

27

27

- cutter head forged from Vanadium steel, oil-hardened and tempered
- handles made of high resistant aluminium pipes

AWG

5/0

5/0

 Δ

g

1090

1360



The Cable Shears in compact and low weight construction (up to 1,000 g less in weight than comparable cable shears) for cable diameters up to 27 mm. Easy and clean cut due to high lever transmission and optimum blade geometry.

Requires 32% less effort

Cutting a multiple wire cable 5 x 50 mm² with these high transmission KNIPEX Cable Shears (length 500 mm) requires handforce of only 560 N (56.0 kp) instead of 830 N (83.0 kp) with Cable Shears 95 21 600 (length 600 mm).



- ▶ with guard
- adjustable screw joint
- replaceable, forged cutter head
- cutter head made of special tool steel, oil-hardened and tempered

95 Cable Cutters, Ratchet Action

patented



95 31 250







95 31 280

- ▶ for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and wire ropes
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- one-hand operation using ratchet principle
- little handforce required due to optimum transmission ratio
- two-stage ratchet drive for easy cutting
- simple handling as a result of low weight and compact design - can be used even in confined areas
- with guard
- special grade tool steel

Models 95 31 250/280:

► fixed handle with support area for putting down the plier when cutting

Models 95 31/36 280:

► suitable for aluminium sector cable up to 4 x 150 mm²



Cutting thicker cables usually requires a high handforce. KNIPEX Ratchet Cable Cutters facilitate this work by means of a two-stage ratchet drive and a handle with support (model 95 31). The cable cutter can be rested on a solid ground so that additional body weight can be applied to lower arm musculature fatigue.





Article-No.	EAN-	Head	Handles	Cuttin	g capa	city	₫
Length	Code	'	'	'			
mm	4003773-			ø mm	mm²	MCM	g
95 31 250	043935	lacquered	with two-colour	32	240	500	575
280	043942		dual component handles	52	380	750	750
95 36 250	026884	lacquered	insulated with two-colour	32	240	500	560
280	026891		dual component handles	52	380	750	735
			★ 1000 V A F F F F F F F F F F F F				
95 39 250	022244	spare moving	g blade				130
95 39 280	025283	spare moving	g blade				260



95 31 280: large cutting capacity: maximum 52 mm dia. / 380 mm²



Ratchet principle and two-stage ratchet drive for easier cutting.

95 Cable Cutters, Ratchet Action



- ► for cutting copper and aluminium cables, single and multiple wire - also with hard rubber or plastic sheath
- ▶ not suitable for steel wire and wire ropes
- also suitable for cables with iron sheath reinforcement
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- ► little handforce required for cutting due to optimum transmission ratio
- high cutting capacity due to two-hand operation and ratchet action

- ► the blade can be opened in any cutting position
- suitable for working in confined areas
- ▶ blades made of special tool steel, oil-hardened and tempered
- handles made of steel tubing



95 31 870: Large cutting capacity: maximum 100 mm dia. / 960 mm²

Article-No. EAN-Head Handles **Cutting capacity** ₽ Code Length 4003773ø mm mm² MCM mm g 95 31 720 025269 lacquered powder coated, 60 740 1400 5370 870 025276 with plastic handles 1900 7090 95 39 720 025290 spare moving blade 595 870 025306 1340

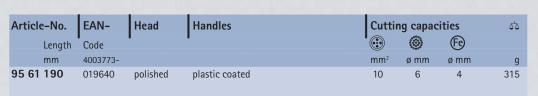




- ▶ for medium hard wire up to 6 mm dia., e. g. Bowden cords, but also for cables and steel
- with opening spring and locking lever
- cutting edges additionally induction hardened
- special blade geometry prevents the wire rope fanning out









95 61 190: Clean cut without fanning out

95 Wire Rope and Cable Cutters









- for wire ropes and steel rods, copper and aluminium cables
- suitable for cutting overhead cables with strain relief wire
- angular cutting blades allow cutting of single rope wire
- optimum transmission ratio for high cutting performance
- low weight
- replaceable cutter head
- high-strength aluminium handles
- cutter head made of special grade tool steel, oil-hardened and tempered

Model 95 81 600:

 with reinforced cutter head for higher performance, also cuts piano wire

			_						
Arti	cle-No.	EAN-	Head	Handles		ng capac	_		47
	Length	Code	•		'⊕	8800	(Fe)		
	mm	4003773-			mm²	ø mm	ø mm	AWG	g
95	71 445	014522	polished	with plastic handles	95	10	7	3/0	1100
	600	014539			150	14	9	5/0	1750
95	77 600	025313	polished	plastic dipped insulated	150	14	9	5/0	2250
				A 1000 V VDE-tested					
95	79 445	025320	spare cutter	head					
	600	025337							
95 8	81 600	025344	polished	with plastic handles	150	16	10	5/0	2280
95 8	89 600	025351	spare cutter	head					

95 Bowden Cable Cutter







- ► for Bowden cables and soft wire rope up to 3.0 mm dia. (also V2A)
- smooth and clean cutting due to special shape of the cutting edges
- sickle shape cutting edges surround the material and prevent the wire rope fanning out
- ► little handforce required due to very high transmission ratio
- with opening spring and locking lever
- cutting edges additionally induction hardened

	EAN-	Head	Handles	Cutting capacities	47
Length	Code			\$ 000 000	
mm	4003773-			ø mm	g
95 61 150	065197	polished	plastic coated	3	200

97 Crimp Grip Pliers



97 00 215 A







97 00 215 A

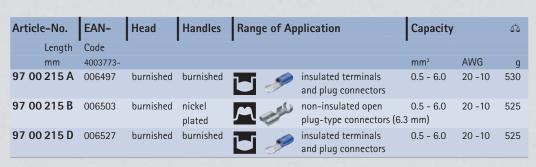
97 00 215 B

97 00 215 D

- ► for solder-free electrical connections
- quick release lever
- ▶ high contact pressure with minimum handforce using toggle lever transmission
- ► reproducible crimping quality with high tensile strength because of zero point lock
- ► adjustable crimping pressure
- ► high strength special grade steel

Model 97 00 215 D:

crimps conductor and insulation in one single operation





97 Crimping Pliers



97 21 215

- ► for cutting cables, stripping wire and crimping insulated and non-insulated terminals, connectors and plug type connectors
- with threaded holes for cutting copper and brass screws threaded M 2.6/3.0/3.5/4.0 and 5.0 mm
- ► high strength special grade steel







97 21 215

97 21 215 B

97 21 215 C

Article-No.	EAN-	Head	Handles	Range of App	olication	Capacity		47
Length	Code					•		
mm	4003773-					mm²	AWG	g
97 21 215	019688	burnished	with plastic handles	5	insulated terminals and plug connectors	0.75 - 6.0	18 -10	235
97 21 215 B	019695	burnished	with plastic handles	M 655	non-insulated open plug-type connectors (6.	0.5 - 2.5 .3 mm)	20 -13	240
97 21 215 C	019701	burnished	with plastic handles	V	non-insulated terminals and plug conn	0.5 - 6.0 ectors	20 -10	225

97 Crimping Pliers



97 32 225



- for cutting cables, stripping wire and crimping insulated and non-insulated terminals and connectors
- ▶ with threaded holes for cutting copper and brass screws threaded M 2.6; 3.0; 3.5; 4.0 and 5.0 mm
- ► high strength special grade steel

Article-No.	EAN-	Head	Handles	Range of A	pplication	Capacity		47
Length	Code	•		•		•		
mm	4003773-					mm²	AWG	g
97 32 225	019718	burnished	with plastic handles	5	insulated terminals and plug connectors	0.5 - 6.0	20 -10	240
				V 🍼	non-insulated terminals and plug connectors	0.5 - 2.5	20 -13	

97 Insertion Tool for LSA-Plus and identical



- ► tool for putting on boards, sockets and fields
- pushing down and cutting in one operation
- ▶ for UTP and STP cables, conductor 0.4 - 0.8 mm dia.
- with integrated pulling hook and release blade





Insertion tool to connect without having to strip



Putting down and cutting the cable in one operation



Article-No.	EAN-	Body	Range of Application	Capacity		7,7
	Code				Length	
	4003773-			ø mm	mm	g
97 40 10	044895	plastic	UTP- and STP-cables,	0.4 - 0.8	175	95
			LSA-Plus and identical			

97 Crimp System Pliers with exchangeable crimp profiles





97 43 200

Model 97 43 200:

► Crimp System Pliers 97 43 200 with service tools (hexagonal key, open end wrench, screws and nuts) in a plastic case. Foam insert with recesses for crimp profiles and locators.

Model 97 43 05/06:

with fixed crimp profile; in cardboard packaging

- ► for solder-free electrical connections
- almost parallel crimping performance
- repetitive, high crimping quality due to precision dies and integral lock (self-releasing mechanism)
- ► these tools have been set precisely (calibrated) in the factory
- optimum transmission of force due to lever action for fatigue-reduced operation
- ergonomically designed handles
- wide range of different crimp profiles for nearly all common crimp connections (see Art. No. 97 49..)
- further special profiles on request
- different locators for precise positioning of the connectors
- all stressed parts are made of special steel, oil-hardened and tempered
- head burnished; with plastic handles



Nearly all common crimp connections can be realized with the KNIPEX Crimp System Pliers simply by exchanging the crimping dies. This comfort represents hand crimping technology at the state-of-the-art and optimum crimping results.



Crimp System Pliers 97 43 200 with crimp profile 97 49 61 and locator 97 49 90 for turned contacts with different pin diameters, swivelling

Article-No.	FAN-	Range of application
A ticic No.	Code	Trange or application
	4003773-	
97 43 200	030812	see crimi
		,

97 43 05 031031

97 43 06 031048

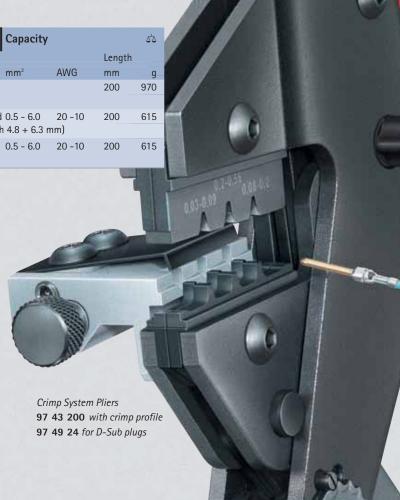
					Length	
			mm²	AWG	mm	g
		see crimp die profile table			200	970
Ī	نكعب	Crimp System Pliers for non-insulated	0.5 - 6.0	20 -10	200	615
Ч		open plug-type connectors (plug width	1 4.8 + 6.3 m	m)		
a		Crimp System Pliers for insulated	0.5 - 6.0	20 -10	200	615
<u> </u>		terminals and plug connectors				
					0.00	0 1



Crimp System Pliers 97 43 200 with crimp profile 97 49 30 for noninsulated butt connectors



Crimp System Pliers 97 43 200 with crimp profile 97 49 35 for spark plug connectors



97 Crimp Profiles and Locators for Crimp System Pliers

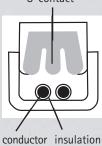
Crimp die profile	Article-No.	EAN-Code	Applications	Capacity		47
	•	4003773-	1	1	AWG	g
20	97 49 04	030850	non-insulated open plug-type connectors	0.1 - 2.5 mm ²	27 - 13	50
	97 49 05	030867	(2.8 + 4.8 mm / 4.8 + 6.3 mm)	0.5 - 6.0 mm ²	20 - 10	55
	97 49 06	030836	insulated terminals and plug connectors	0.5 - 6.0 mm ²	20 - 10	55
-9	37 43 00	030030	msulated terminals and plug connectors	0.5 - 0.0 11111	20 - 10	33
	07 40 16	040075	inculated tarminals and plug connectors	10/10 mm²	7/5	F0
-	97 49 16	040675	insulated terminals and plug connectors	10/16 mm ²	7/5	50
	07.40.00	000074	(6 1)	0.05 0.0 3	00 40	
	97 49 08	030874	end sleeves (ferrules)	0.25 - 6.0 mm ²	23 - 10	55
	97 49 09	030881	end sleeves (ferrules)	10/16/25 mm ²	7/5/3	55
	97 49 18	063186	twin end sleeves (ferrules)	2 x 6/10/16 mm ²	10/7/5	65
			for flexible conductors			
	97 49 19	030898	end sleeves (ferrules)	35/50 mm ²	2/0	65
	97 49 13	030843	non-insulated terminals and plug connectors	0.5 - 10 mm ²	20 - 7	55
	97 49 23	052135	non-insulated terminals and plug connectors	16 + 25 mm ²	5 + 3	55
OO Ma	97 49 15	043164	lug connectors and	1.25 - 2.5 mm ²	17 - 13	55
			non-insulated plug connectors 4.8 + 6.3 mm	3.0 - 6.0 mm ²	12 - 10	
	97 49 20	045069	F-connectors for TV and satellite	Ø 9.6/SW 8.4 + 8.1 n		55
	37 13 20	3 10000	connectors	Ø 7.8/SW 7.0 mm	,	- 33
	97 49 24	030911	D-Sub-plugs	0.03 - 0.56 mm ²	32 - 20	45
	37 43 24	030911	D-3u0-plugs	0.03 - 0.36 11111	32 - 20	45
1	07.40.00	020024	and Southful to	15 10	45. 7	
	97 49 30	030904	non-insulated butt connectors	1.5 - 10 mm ²	15 - 7	55
	97 49 35	034315	spark plug connectors + distributors	1.0 mm ²	17	55
- A 100	97 49 40	030959	Coax connectors	RG 58, 59, 62, 71, 22	3	60
	97 49 50	030966	Coax connectors/Car phone	RG 58, 174, 188, 316		60
An Link	97 49 44	041443	rolled contacts	0.14 - 1.5 mm ²	26 - 15	50
00	97 49 54	041450	modular plugs	0.5 - 2.5 mm ²	20 - 13	55
	07 40 04	041430	modular prags	0.5 2.5 11111	20 13	33
	97 49 60	030928	turned contacts (HTS + Harting)	0.14 - 4.0 mm ²	26 - 11	55
	37 43 00	030320	turned contacts (1113 + Harting)	0.14 - 4.0 111111	20 - 11	33
	07.40.60	000170		0.5/4.0	10/11	00
	97 49 62	063179	solar connectors (Hubert + Suhner)	2.5/4.0 mm ²	13/11	60
	97 49 64	044093	ABS connectors	1.0 - 6.0 mm ²	17 - 10	60
1 🚕	97 49 70	030942	unshielded Western plugs	4/6/8-poles		60
100				RJ 10. 11. 12. 45		
1 4	97 49 74	044062	unshielded Molex plugs	8-poles		55
1000				RJ 12/RJ 45		
	97 49 76	047513	shielded Stewart plugs			50
			· ·			
20.00	97 49 81	042778	Harting connectors	SW 3.0/Ø 3.5; SW 4.9	95/Ø 6.0:	55
300			for fibre optics	SW 6.5/Ø 7.5		
	97 49 82	042785	Telegärtner connectors	SW 3.25/Ø 3.6; SW 3	65/0/40	55
57	07 10 02	012700	for fibre optics	SW 4.52/Ø 5.4	.00/10 1.0/	00
	97 49 83	044079	LWL-ST-, SC- + STSC-K-plugs	SW 3.65/Ø 4.1; SW 4	2/0/46.	55
500	37 43 03	0440/3			.2/0 4.0,	33
	07.40.04	040700	for fibre optics	SW 5.0/Ø 6.0	NO FO	
535	97 49 84	042792	Harting/Suhner connectors	SW 3.8/Ø 4.5; SW 4.3	3/0 5,2;	55
	07.40.67	0.4052.1	for fibre optics	SW 4,95/Ø 6,0		
535	97 49 87	043331	F-SMA; ST and MIC connectors	SW 8,7/Ø 9,5		50
			for fibre optics			
	97 49 90	031017	Locator for 97 49 60			70
			(HTS + Harting)			
	97 49 91	045144	Locator for 97 49 61 (Harting)			70
	97 49 93	047926	Locator for 97 49 24 (D-Sub-plugs)			70
والم المحالية	97 49 94	030997	Locator for 97 49 04			20
40	97 49 95	031000	Locator for 97 49 05			20

97 Crimping Pliers for Scotchlok Connectors, with side cutter

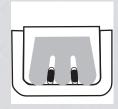


- ► for crimping plastic-insulated telecommunication or signal cables using the U-contact principle in single Scotchlok connectors
- no stripping necessary, U-shaped elements make the connection
- cutting edges additionally induction hardened
- with opening spring
- ► Vanadium steel, oil-hardened and tempered









Article-No.	EAN-	Style	Head	Handles	Range	of Application	Capacity		47
	Code							Length	
4003773-							ø mm	mm	g
97 50 01	028239	www	polished	plastic	40	Scotchlok	0.4 - 1.1	155	135
				coated	E	single			

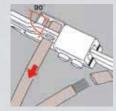
97 Crimping Pliers for Western Plugs



- ▶ for cutting and stripping unshielded ribbon telephone
- ► for crimping 4-pole Western plugs type RJ 10 (7.65 mm wide)
- head burnished, with plastic handles









Cut cables

Strip cables

Article-No. EAN-Code 4003773-97 51 04 028048 97 59 06 029700

Range of Application			Capacity		7.7
•			•	Length	
-				mm	g
7	4	Western plugs	RJ 10 (4-poles) 7.65 mm	190	230
	(200 E)	4 spare blades for	97 51 04 / 10 / 12		

97 Crimping Pliers for Western Plugs



- professional tool for cutting and stripping unshielded ribbon telephone cables
- ► for crimping 6- and 8-pole Western plugs type RJ 11/12 (9.65 mm width) and type RJ 45 (11.68 mm width)
- exact crimping process due to parallel crimping
- repetitive, high crimping quality due to integral lock (self-releasing mechanism)
- optimum transmisson of force due to lever action for fatigue-reduced operation
- ▶ with length cutter and dismantling knife for ribbon cables 6 and 12 mm length

- with additional stripping device for round cables
- head burnished, with twocolour dual component handles



Precise, clean crimping

Article-No.	EAN-	Range of Ap	plication	Capacity		47
	Code	•		•	Leng	th
	4003773-				mm	g
97 51 10	043171		Western plugs	RJ 11/12 (6-poles) 9.65 mm; RJ 45 (8-poles) 11.68 mm	190	300
		100				
97 59 06	029700	400	4 spare blades for 9	97 51 04 / 10 / 12		

97 Crimping Pliers for Western Plugs









8-poles

- professional tool for cutting and stripping unshielded ribbon telephone cables
- ► for crimping 4-, 6- and 8-pole Western plugs type RJ 10 (7.65 mm width), type RJ 11/12 (9.65 mm width) and type RJ 45 (11.68 mm width)
- exact crimping process due to parallel crimping
- repetitive, high crimping quality due to integral lock (self-releasing mechanism)
- optimum transmisson of force due to lever action for fatigue-reduced operation
- ▶ with length cutter and dismantling knife for ribbon cables 6 and 12 mm length
- head burnished, with twocolour dual component handles

Article-No.	EAN-	Range of Application	Capacity		47
	Code	•	•	Length	
	4003773-			mm	g
97 51 12	043188	Western plugs	RJ 10, (4-poles) 7.65 mm	200	530
	-		RJ 11/12 (6-poles) 9.65 mm		
		alle alle alle	RJ 45 (8-poles) 11.68 mm		
97 59 06	029700	4 spare blades for 97 51 04 / 10 / 12			



Crimping Pliers with cutting and dismantling device

97 Four-Mandrel Crimping Pliers for turned contacts



- for crimping turned contacts
- for solder-free electrical connections
- four-mandrel crimping for exact crimping performance
- mandrel gauge to check the basic setting
- locator for positioning the contacts
- repetitive, high crimping quality due to integral lock (self-releasing mechanism)
- these tools have been set precisely (calibrated) in the factory
- optimum transmisson of force due to lever action for fatigue-reduced operation
- high operation comfort thanks to handy shape
- all stressed parts are made of special steel, oil-hardened and tempered

Model 97 52 63:

- ▶ fine adjustment of pressure depending on the conductor's diameter by means of adjusting
- nickel plated head, two-colour dual component handles

Model 97 52 64:

- pressure adjustment depending on the conductor's diameter by means of adjusting wheel in 4 different positions
- nickel plated head, two-colour dual component handles

Model 97 52 65:

- ▶ fine adjustment of pressure depending on the conductor's diameter by means of adjusting
- ▶ nickel plated head, plastic handles

Model 97 52 63 DG:

- ▶ fine adjustment of pressure depending on the conductor's diameter by means of adjusting wheel
- ▶ with digital display of the preset crimping capacities
- ▶ display reversible between mm / inch and MIL numerical values
- ▶ nickel plated head; with twocolour dual component handles

Model 97 52 65 DG:

- ▶ fine adjustment of pressure depending on the conductor's diameter by means of adjusting wheel
- with digital display of the preset crimping capacities
- display reversible between mm / inch and MIL numerical values
- ▶ nickel plated head; with plastic handles



97 52 63/65 DG: Pliers with locator and service tools in a plastic case eith foam insert

Article-No.	EAN-	Range of Appli	cation	Capacity			47
	Code	•		•		Length	
	4003773-			mm²	AWG	mm	g
97 52 63	050148	X	turned contacts	0.08 - 2.5	28 - 13	180	370
97 52 63 DG	063209	X	terminales girados	0.08 - 2.5	28 - 13	195	380
97 52 64	041481	X	turned contacts	0.08 - 2.5	28 - 13	180	415
97 52 65	045236	X	turned contacts (Harting)	0.14 - 6.0	26 - 10	230	680
97 52 65 DG	063216	X	terminales girados (Harting)	0.14 - 6.0	26 - 10	250	700

Locator for the contacts



Four-mandrel squeezing for exact crimping performance

97 52 65 DG

97 Lever Action Crimping Pliers, also for two-hand operation

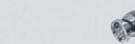


97 52 04

97 52 06







Article-No.	EAN-	Range of Appli	cation Capacity	\$			
	Code	•	•			Length	1
	4003773-			mm²	AWG	mm	g
97 52 03	025443	V	non-insulated terminals and plug connectors	4.0 - 10.0	11 - 7	250	565
97 52 13	048084			0.5 - 10.0	20 - 7	250	570
97 52 23	052159			16 + 25	5 + 3	250	565
97 52 04	025450		non-insulated, open	0.1 - 2.5	27 - 13	250	565
			plug-type connectors				
97 52 05	025467			0.5 - 6.0	20 - 10	250	570
97 52 06	025474		insulated terminals	0.5 - 6.0	20 - 10	250	560
			and plug connectors				
97 52 08	025481	7 (end sleeves	0.5 - 6.0	23 - 10	250	575
97 52 09	025498		(ferrules)	10/16/25	7/5/3	250	570
97 52 19	052142			35 + 50	2 + 0	250	575
97 52 10	023678		COAX-, BNC- and			250	575
			TNC- connectors,				
			RG 58				
			RG 59/62/71/223				
97 49 94	030997	472	locator for ArtNo. 97 52 04				20
97 49 95	031000	-	locator for ArtNo. 97 52 05				20

▶ new generation of lever action crimping pliers

for solder-free electrical

► the new lever transmission

reduces the handforce up to

30% compared with regular

quality due to precision dies

(self-releasing mechanism)

two-hand operation for easy crimping of large conductor

easy handling as a result of well balanced centre of gravity, angled head and ergnomically

all stressed parts are made of

special steel, oil-hardened and

head burnished, non-slip plastic

▶ these tools have been set precisely (calibrated) in

connections

crimping pliers

and integral lock

the factory

diameters

tempered

97 52 10

shaped handles

coated handles

repetitive, high crimping

With the new generation of Crimping Pliers even large conductor cross sections that normally require a high handforce can be crimped easily. The new lever transmission reduces the necessary handforce up to 30% compared with regular crimping pliers.



First step: move the handle with two fingers only until both jaws touch the connector to be crimped



Second step: now use the whole hand for further crimping procedure



Third step: when greater handforce is required, such as e. g. when crimping insulated connectors 6.0 mm², two hand operation is possible by the longer handles

97 Crimping Pliers "PreciForce"





- ► for solder-free electrical connections
- repetitive, high crimping quality due to precision dies and integral lock (self-releasing mechanism)
- these tools have been set precisely (calibrated) in the factory
- ► high transmission of force thanks to lever action for fatigue-reduced working

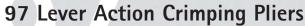


larger crimp cross sections.

- good handling thanks to favourable handle position, low weight, short design and ergonomically shaped handles
- ▶ all stressed parts are made of special steel, oil-hardened and tempered
- head burnished, with twocolour dual component handles



Article-No.	EAN-	Range of Applicatio	n	Capacity			47
	Code	•		•		Length	
	4003773-			mm²	AWG	mm	g
97 52 30	051855		non-insulated	1.5 - 10.0	15 - 7	220	490
			butt connectors				
97 52 33	051862	T.	non-insulated terminals	0.5 - 10.0	20 - 7	220	490
		V	and plug connectors				
97 52 34	051879	ناه د	non-insulated open	0.1 - 2.5	27 - 13	220	490
97 52 35	051886	M	plug-type connectors	0.5 - 6.0	20 - 10	220	490
			2.8+4.8 mm / 2.8+6.3 mm				
97 52 36	051893		insulated terminals	0.5 - 6.0	20 - 10	220	490
			and connectors				
97 52 37	063193	V	heat shrinkeable	0.5 - 6.0	20 - 10	220	480
			sleeve connectors				
97 52 38	051909		end sleeves	0.25 - 6.0	23 - 10	220	490
			(ferrules)				
97 52 50	051916		COAX-BNC-			220	490
			connectors RG 58, 174, 188, 3	16			
97 49 94	030947	<i>6</i> 3.	locator for 97 52 34				
97 49 95	031000	-76	locator for 97 52 35				





- ► for solder-free electrical connections
- repetitive, high crimping quality due to precision dies and integral lock (self-releasing mechanism)
- these tools have been set precisely (calibrated) in the factory
- transmission of force optimum due to lever action for fatiguereduced operation
- ▶ good handling due to 20° angled head, low weight and short design
- ► all stressed parts are made of special steel, oil-hardened and tempered

Model 97 52 14:

available as accessory: locator for non-insulated plug connectors

-								
Article-No.	EAN-		Range	of Application	Capacity			44
	Code		•		·		Length	
	4003773-				mm²	AWG	mm	g
97 52 14	026808		الكاير	non-insulated open	0.1 - 1.5	27 - 15	195	375
				plug-type connectors 2.8	3+4.8 mm			
97 52 20	026853	6	200	COAX- BNC- and TNC- o	onnectors		195	375
		400	6 9	SW 1.72 mm for conduct	tors,			
				shield 5,4 mm for RG 58,				
				shield 6,48 mm for RG 5	9/62/71/223			
97 59 14	026976	é	13	locator for 97 52 14				20
		_	TO .					

97 Self-Adjusting Crimping Pliers for End Sleeves (ferrules)

97 53 04



0.08 - 6.0 mm²

square crimp



hexagonal crimp

- ► for crimping end sleeves (ferrules) according to DIN 46228 parts 1 + 4
- ► for solder-free electrical connections
- ► lateral loading of the end sleeves (ferrules) into the tool
- simple handling as a result of self-adjustment to the size of the end sleeve (ferrule)
- repetitive, high crimping quality due to integral lock (self-releasing mechanism)
- these tools have been set precisely (calibrated) in the factory
- optimum transmisson of force due to lever action for fatigue-reduced operation
- ► high operation comfort thanks to handy shape and low weight
- all stressed parts are made of special steel, oil-hardened and tempered

Specia

The Self-Adjusting Crimping Pliers for end sleeves (ferrules) adjusts automatically to the connector size desired in one profile. This means comfortable, reliable and fast crimping.

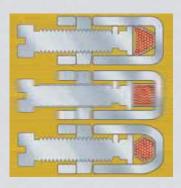
Model 97 53 04:

 square crimping for optimum contact areas in the clamp connection

Model 97 53 14:

 heaxagonal crimping for optimum positioning in confined areas

Article-No.	EAN-	Range of Applica	tion	Capacity			₽.
	Code	•				Length	
	4003773-			mm²	AWG	mm	g
97 53 04	028017		end sleeves	0.08 - 10	28 - 7	180	380
			(ferrules)				
97 53 14	041474		end sleeves	0.08 - 6.0	28 - 10	180	400
			(ferrules)				



The section shows clearly that the square crimping produces a better contact than the trapezoidal crimping.

The hexagonal crimping comes close to the space saving round shape and guarantees optimum contact in narrow round terminal connectors, in contrast to square crimping of the same cross-section



Square-crimped end sleeves (ferrules) ensure good contact zones regardless of the position in the terminal connector



97 Self-Adjusting Crimping Pliers for End Sleeves (ferrules)

with front loading, patented





square crimp



97 53 09



square crimp

- ► for crimping end sleeves (ferrules) according to DIN 46228 parts 1 + 4
- for solder-free electrical connections
- front loading of the end sleeves (ferrules) into the tool
- ► simple handling as a result of self-adjustment to the size of the end sleeve (ferrule)
- with square crimping for optimum contact areas in the clamp connection
- repetitive, high crimping quality due to integral lock (self-releasing mechanism)
- ► these tools have been set precisely (calibrated) in the factory
- optimum transmisson of force due to lever action for fatigue-reduced operation
- high operation comfort thanks to handy shape and low weight
- all stressed parts are made of special steel, oil-hardened and tempered



The Self-Adjusting Crimping Pliers for end sleeves (ferrules) with front and lateral loading allows secure and comfortable working even in confined areas.

Model 97 53 08:

- crimping from 0.08 10.0 mm² in one profile
- end sleeves (ferrules) up to 2.5 mm² can also be loaded parallely from the side

Model 97 53 09:

- rimping from 0.08 10.0 and 16.0 mm² in one profile
- with selector lever for setting the crimping area either to 0.08 - 10 mm² or 16 mm²

Article-No.	EAN-	Range of Application	Capacity	47
	Code	'	•	Length
	4003773-		mm² AV	VG mm g
97 53 08	040187	end sleeves	0.08 - 10.0 28	- 7 190 475
		(ferrules)		
97 53 09	044550	end sleeves	0.08 - 10.0 +16 28	-7+5 190 475
		(ferrules)		



Front loading of end sleeves (ferrules) e. g. in switchboards



97 53 08: Lateral loading of end sleeves (ferrules) e. g. in confined



Square crimping for optimum contact zones

97 Parallel Crimping Pliers, for Micro Plugs



- parallel crimping performance to satisfy the particularly high standards of small connectors
- ► for solder-free electrical connections
- repetitive, high crimping quality due to precision dies and integral lock (self-releasing mechanism)
- ► fixed locator for D-Sub micro plugs for an exact positioning of connector and cable

>	these t	ools have been set preci-
	sely (ca	librated) in the factory

- optimum transmission of force due to toggle lever for fatigue-reduced operation
- crimping pliers for other mini plugs as e. g. HD 22, Modu IV, Micro Timer, MQS, .. on request
- all stressed parts are made of special steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Range of	Application	Capacity			2,7
	Code							Length	
	4003773-					mm²	AWG		g
97 54 24	060215	burnished	with two-colour	dual 🧀	D-Sub,	0.03 - 0.56	32-20	190	290
			component hand	les	D-Sub HD 20 ar	nd D-Sub-HDE	plugs		

97 Crimping Pliers for End Sleeves (ferrules)



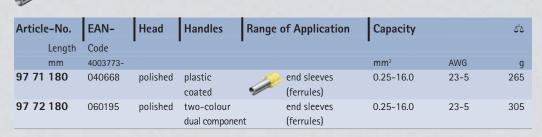
- for crimping end sleeves (ferrules) according DIN 46228 parts 1 + 4 in an area of application from 0.25 up to 2.5 mm²
- crimping in marked trapezoidal dies for secure connections between the sleeve and the conductor
- Vanadium steel, oil-hardened and tempered

Artic	cle-No.	EAN-	Style	Head	Handles	Range of Application		Capacity		47
	Length	Code	•		•			•		
	mm	4003773-						mm²	AWG	g
97 6	61 145 A	024149		polished	plastic	s s	end sleeves	0.25 - 2.5	23 - 13	140
					coated	1	(ferrules)			
97 6	S1 145 F	027218	WWW	polished	plastic	A)	end sleeves	0.25 - 2.5	23 - 13	140
					coated	1	(ferrules)			
97 6	S2 145 A	060154		polished	two-colour	See	end sleeves	0.25 - 2.5	23 - 13	165
					dual compon	ent	(ferrules)			

97 Crimping Pliers for End Sleeves (ferrules)



- ▶ for crimping end sleeves (ferrules) according DIN 46228 parts 1 + 4 from 0.25 to 16 mm²
- crimping in marked half-round dies for secure connections between the sleeve and the conductor
- ▶ 9 extremely deep troughs with conical side faces
- special tool steel, oil-hardened and tempered

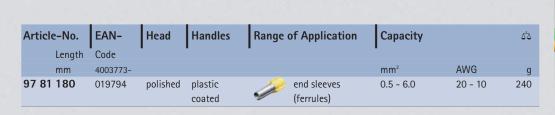




97 Crimping Pliers for End Sleeves (ferrules) with front loading



- ► for crimping end sleeves (ferrules) according DIN 46228 parts 1 + 4 from 0.5 to 6.0 mm²
- ideal for work in confined areas, e.g. in narrow and deep switch boxes
- special tool steel, oil-hardened and tempered





front view

97 Crimp Assortments, for cable connectors

- ▶ in a TANOS MINI-systainer™ (solid plastic box)
- ► two stackable plastic inserts with 6 trays each for connectors
- with an assortment of standard cable connectors

Model 97 90 00:

with Crimp Grip Pliers 97 00 215 A

Model 97 90 01:

▶ with Crimping Pliers 97 32 225







several boxes can be connected with each other

Article-No.	EAN-	Crimping Pliers	25 Terminals each	7,7
	Code			
	4003773-			g
97 90 00	025375		style and description as per	1450
		97 00 215 A	Article-No. 97 99 - 01/02/04/07/09/14/16/	
97 90 01	025382	THE PARTY NAMED IN COLUMN TWO IS NOT THE PARTY NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED		1180
		97 32 225		

97 Crimp Assortments, for end sleeves (ferrules)



- ▶ in a TANOS MINI-systainer™ (solid plastic box)
- two stackable plastic inserts with 6 trays each for connectors
- with an assortment of end sleeves (ferrules) with/without collar

Model 97 90 05:

- with Crimping Pliers for End Sleeves 97 71 180
- end sleeves (ferrules) without collar

Model 97 90 06:

- with Crimping Pliers for End Sleeves 97 71 180
- end sleeves (ferrules) with collar

Model 97 90 07:

- ▶ with Crimping Pliers for End Sleeves 97 61 145 F
- end sleeves (ferrules) without collar

Model 97 90 08:

- ► with Crimping Pliers for End Sleeves 97 61 145 F
- end sleeves (ferrules) with collar

Model 97 90 09:

- ► with Self-Adjusting Crimping Pliers for End Sleeves (ferrules) 97 53 04
- end sleeves (ferrules) with collar

Model 97 90 10:

- ➤ with Self-Adjusting Insulation Stripper 12 40 200 and Self-Adjusting Crimping Pliers for End Sleeves (ferrules) 97 53 04
- end sleeves (ferrules) with collar

Model 97 90 12:

- ➤ with Self-Adjusting Insulation Stripper 12 40 200 and Self-Adjusting Crimping Pliers for End Sleeves (ferrules) 97 53 08
- end sleeves (ferrules) with collar

Model 97 90 23:

- with Crimping Pliers "PreciForce" for End Sleeves (ferrules)97 52 38
- end sleeves (ferrules) with collar

Model 97 90 24:

- with Self-Adapting Universal Insulation Stripper "Multistrip 10" 12 42 195
- with Self-Adjusting Crimping Pliers for End Sleeves (ferrules) 97 53 08
- end sleeves (ferrules) with collar







several boxes can be connected with each other

Article-No.	EAN-	Pliers		Terminal	s each							Δ'Δ
	Code			500	300	200	150	100	75	50	40	
		·							·			
	4003773-			mm²	mm²	mm ²	mm²	mm²	mm²	mm ²	mm²	g
97 90 05	025535		-			0.5/0.75/	4.0/6.0			10.0/		945
		97 71 180				1.0/1.5/2.5	<u> </u>			16.0		
97 90 06	025542		_			0.5/0.75/	2.5		4.0/6.0	10.0	16.0	1015
		97 71 180	_			1.0/1.5						
97 90 07	026877	pio i u		0.5/0.75/								830
		97 61 145 F	-	1.0/1.5/2.5	i							
97 90 08	026990	00011			0.5/0.75/	2.5						840
		97 61 145 F	-		1.0/1.5							
97 90 09	028574		>			0.5/0.75/		4.0/6.0		10.0		1170
		97 53 04				1.0/1.5/2.5	;					
97 90 10	046202					0.5/0.75/1.	.0/	4.0/6.0		10.0		1360
		97 53 04	12 40 200			1.5/2.5						
97 90 12	048916		P 45			0.5/0.75/1.	.0/	4.0/6.0		10.0		1430
		97 53 08	12 40 200			1.5 / 2.5						
97 90 23	062158	0, 00 00	D			0.5/0.75/1.	.0/	4.0/6.0				1220
		97 52 38				1.5/2.5		·				
97 90 24	062394	37 32 30				0.5/0.75/1.	.0/	4.0/6.0		10.0		1355
		97 53 08	12 42 195			1.5/2.5						

97 Crimp Assortments, for cable connectors



- ▶ in a TANOS MINI-systainer™ (solid plastic box)
- ► two stackable plastic inserts with 6 trays each for connectors
- with an assortment of standard cable connectors

Model 97 90 21:

▶ with Crimping Pliers "PreciForce" 97 52 36 (for insulated terminals and plug connectors)

Model 97 90 22:

- ▶ with Self-Adapting Universal Insulation Stripper "Multistrip 10" 12 42 195
- ▶ with Crimping Pliers "PreciForce" 97 52 36 (for insulated terminals and plug connectors)





Article-No.	EAN-	Crimping Pliers		25 terminals each	20 terminals each	۵'۵
	Code				'	
	4003773-			style and description as per Article-No.		g
97 90 21	062134			97 99 01/02/14/15/	97 99 21/22/36	1420
		97 52 36				
97 90 22	062141			16/17/18/34/35		1550
		are a	222			
		97 52 36	12 42 195			

systainer™ is a registered trademark of TANOS GmbH

	.		I	1	1.	1	Luus		
P	Style	Article-No.	EAN-Code	wide x	plug	cable	AWG	colour	
à.			4002772	thick mm ²	ø mm	mm²			1
	Female Sockets	97 99 01	4003773- 025559	6.3 x 0.8	_	0.5 - 1.0	20-17	red	75
z	Telliare Sockets	97 99 02	025566	6.3 x 0.8	_	1.5 - 2.5	15-13	blue	50
3	23	97 99 03	025573	6.3 x 0.8	_	4.0 - 6.0	11-10	yellow	25
7	(37)	97 99 04	025580	8.0 x 0.8	_	1.5 - 2.5	15-13	blue	50
Ш	Male Con-	97 99 05	025597	6.3 x 0.8	_	0.5 - 1.0	20-17	red	75
	nectors	97 99 06	025603	6.3 x 0.8	_	1.5 - 2.5	15-13	blue	75
Ç	Round	97 99 07	025610	-	4.0	0.5 - 1.0	20-17	red	25
٩,	Sockets	97 99 08	025627	-	5.0	1.5 - 2.5	15-13	blue	25
A	Round Pin	97 99 09	025634	-	4.0	0.5 - 1.0	20-17	red	75
Ø,	Plugs	97 99 10	025641	-	5.0	1.5 - 2.5	15-13	blue	50
1	Flat Pin Accessory	97 99 11	025658	6.3 x 0.8	-	0.5 - 1.0	20-17	red	25
0	Distributors	97 99 12	025665	6.3 x 0.8	-	1.5 - 2.5	15-13	blue	25
4	Cable Connectors,	97 99 13	025672		3.0*	0.5 - 1.0	20-17	red	100
1	eye type	97 99 14	025689		4.0*	0.5 - 1.0	20-17	red	100
		97 99 15	025696		5.0*	0.5 - 1.0	20-17	red	100
		97 99 16	025702		4.0*	1.5 - 2.5	15-13	blue	100
6		97 99 17	025719		5.0*	1.5 - 2.5	15-13	blue	50
ý.		97 99 18	025726		6.0*	1.5 - 2.5	15-13	blue	50
		97 99 19	025733		8.0*	1.5 - 2.5	15-13	blue	50
		97 99 20	025740		5.0*	4.0 - 6.0	11-10	yellow yellow	25
y		97 99 21	025757		6.0*	4.0 - 6.0	11-10	yellow	25
		97 99 22	025764		8.0*	4.0 - 6.0	11-10	yellow	25
и		97 99 23	025771		10.0*	4.0 - 6.0	11-10	red	25
	Cable Connectors,	97 99 24 97 99 25	025788 025795		3.0* 4.0*	0.5 - 1.0	20-17	red	100
	forked	97 99 26	025795		4.0 5.0*	0.5 - 1.0 0.5 - 1.0	20-17 20-17	red	100 75
C		97 99 27	025801		4.0*	1.5 - 2.5	15-13	blue	75
P		97 99 28	025825		5.0*	1.5 - 2.5	15-13	blue	50
4	•	97 99 29	025832		5.0*	4.0 - 6.0	11-10	yellow	25
C		97 99 30	025849		6.0*	4.0 - 6.0	11-10	yellow	25
	Round Pattern	97 99 31	025856	_	-	0.5 - 1.0	20-17	red	100
•	Cable	97 99 32	025863	_	_	1.5 - 2.5	15-13	blue	100
	Connectors	97 99 33	025870	_	_	4.0 - 6.0	11-10	yellow	25
	Insulated Butt	97 99 34	025887	_	_	0.5 - 1.0	20-17	red	50
	Connectors	97 99 35	025894	-	-	1.5 - 2.5	15-13	blue	50
3		97 99 36	025900	-	-	4.0 - 6.0	11-10	yellow	25
4	Two-Way-Sockets	97 99 37	025917	6.3 x 0.8	-	-			25
9	(COLC))							
Ч	Accessory	97 99 38	025924	6.3 x 0.8	-	-			50
	Distributors				Length m	ım			
	End Sleeves	97 99 40	025931		6.0	0.5	20		200
	(ferrules)	97 99 41	025948		6.0	0.75	18		200
		97 99 42	025955		6.0	1.0	17		200
-		97 99 43	025962		7.0	1.5	15		200
		97 99 44	025979		7.0	2.5	13		200
		97 99 45	025986		9.0	4.0	11		150
		97 99 46	025993		10,0	6.0	10		150
		97 99 47	026006		12.0	10.0	7		50
A		97 99 48	026013		12.0	16.0	5		50
		97 99 49	026020		18.0	25.0	3	white	50
X	End Sleeves	97 99 70 97 99 71	024248 024255		8.0 8.0	0.5 0.75	20 18	grey	200 200
1	(ferrules)	97 99 71	024255		8.0	1.0	17	red	200
U	with collar	97 99 72	024262		8.0	1.5	15	black	200
1		97 99 74	024279		8.0	2.5	13	blue	200
7		97 99 75	024280		10.0	4.0	11	grey	150
		97 99 76	026044		12.0	6.0	10	yellow	150
2		97 99 77	026051		12.0	10.0	7	red	50
11		97 99 78	026068		12.0	16.0	5	blue	50
2		97 99 79	026075		16.0	25.0	3	yellow	50
	Non-insulated	97 99 92	031123	2.8		1.5	15		150
6	Plug	97 99 93	031130	4.8		1.5	15		150
	Connectors	97 99 95	031147	6.3		1.5	15		100
\leq		97 99 96	031154	6.3		2.5	13		100





Testing electrical insulation
After submersion in water for 24 hours, the tools are tested with AC 10,000 V for 3 minutes including measuring of the leakage current. The reading of the leakage current must stay below the limits defined in the standards.



Testing low temperature impact strength

The tools are cooled down

The tools are cooled down to – 25°C. The insulation material must retain the toughness necessary to ensure that it does not break when hit or knocked.



Testing dielectric strength
Each KNIPEX & 1000 V insulated
tool has been tested individually.
This individual testing is done
with a test voltage of AC 10,000
volts. This test load, which is 10
times as high as the maximum
permitted voltage during work,
inspires the user to trust a
reliable insulation when live



Testing the adhesion of the insulating coating

working.

The adhesion of the insulation coating is tested after storage for 168 hours at 70°C. In case of pliers a tensile load of 500 N is applied. The insulating material must remain firmly bonded to the basic tool.



Testing burning behaviour KNIPEX uses only flame-resistant and self-extinguishing plastics for insulation.



Testing indentation resistance
The insulation heated to 70°C
must prove under standardised

test conditions that the warm plastic has sufficient mechanical strength to resist expected loads.

Insulated tools

KNIPEX insulated tools - 100% tested, one by one

When working on electrical installations, the safest is to disconnect these systems from the energy supply first.

Only a skilled and qualified electrician may work on live installations and then only in conformance with the relevant industrial safety standards, in Germany, e. g. VDE 0105, and international standards, e. g. EN 50110 or IEC 60364. He must also use special tools which have been specifically produced and tested for this kind of work.

KNIPEX insulated tools are made of high-quality materials, which have been manufactured and tested in conformance with the regulations of national and international standards.

If the descripted methods for live working, e. g. DIN VDE 0105, EN 50110, IEC 60364, are observed, these tools offer the best possible protection when it is necessary to work live up to AC 1000 V (alternating current) and DC 1500 V (direct current).

Since 1987 the IEC 60900 has specified worldwide requirements for tools for live working. EN 60900 made these mandatory for the EU countries since 1st Aug. 1995. Tests on tools which bear the special mark ★ 1000 V include subjecting them to routine tests up to 10,000 volts to check their dielectric strength. Efficient insulation is guaranteed when touching live parts up to 1,000 volts.

1000 VIEC 60900 DIN EN 60900

The A 1000 V and marks identify KNIPEX insulated tools as being suitable for live working. The standard also specified shows the requirements against which this can be verified. The manufacturer name KNIPEX on the insulation indicates that we accept

responsibility for the correctness of these information. This is important because the purchase of insulated tools is a matter of trust.

The observation of these requirements is monitored not only by the KNIPEX quality assurance team but also e. g. by VDE (Association of German Electricians).



Sample tests, manufacturing inspections and stock control by the neutral VDE inspection office.

Handle Insulation (Finish 6)

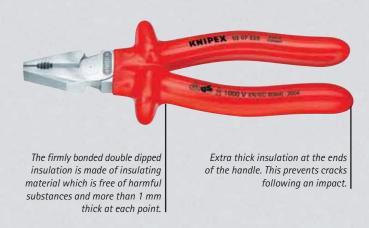
KNIPEX pliers with the two-colour dual component handle insulation meet the requirements of VDE 0682 part 201 and corresponding international standards (e. g. EN 60900 or IEC 60900). This claim is confirmed by the VDE/GS mark awarded by an obligatorily neutral inspection office.



The slip guard is designed to prevent any spark-over from the non-insulated working head to the hand.

Dipped Insulation (Finish 7)

KNIPEX pliers with dipped insulation meet all requirements set by the VDE standard and corresponding international standards (e. g. IEC 60900 and DIN EN 60900). They bear the VDE/GS mark. Because of their shape, tools such as open end wrenches, box wrenches, socket wrenches, ratchets, etc., are insulated by coating with plastics in a dipping process. To offer a complete range of tools for live working in a similar design, KNIPEX insulated pliers are also availabe in a dipped insulated version.



Always follow the statutory regulations and obey the SAFETY INSTRUCTIONS given below:

- Always transport your tools for live working in a manner that prevents any damage to the insulation.
- Check before every use wether the insulation is damaged and discard any defective tools found.
- Always keep your insulated tools clean and dry.
- Wear protective goggles when working with cutting nippers or working overhead.
- ► Make sure the working area is clean and orderly when you are working live.
- Wear protective clothing and use safety equipment (e. g. insulating gloves, insulating mats, protective handles), – especially in confined working areas.
- ▶ Use the right tool size. This prevents the tool slipping on the work piece and unintentional contact with non-insulated parts.
- Make sure that loose parts and cut-off ends of cables do not fall onto live parts.

01 Combination Pliers, Chrome Vanadium

DIN ISO 5746





EAN-	Head	Handles	Cutt	ing ca	paciti	ies	5,2
Code			•		••••		
4003773-			ømm	ømm	ømm	mm²	g
040729	chrome	insulated with two-colour	2.0	1.5	10.0	16.0	210
	plated	dual component handles					
040415	chrome	↑ 1000 V ♠ ♦ VDE-tested	2.5	2.0	13.0	25.0	300
	plated						
	Code 4003773- 040729	Code 4003773- 040729 chrome plated 040415 chrome	Code 4003773- 040729 chrome insulated with two-colour plated dual component handles 040415 chrome ★ 1000 V ▲ VDE-tested	Code 4003773- 040729 chrome insulated with two-colour 2.0 plated dual component handles 040415 chrome \(\triangle \) 1000 V \(\triangle \) VDE-tested 2.5	Code	Code	Code Image: Code with two code

- for heaviest duty
- with gripping zones for flat and round material, suitable for versatile use
- with cutting edges for soft, hard and piano wire
- long cutting edges for thicker cables
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- ► particularly wear resistant gripping jaws; hardness of the gripping jaws approx. 53 HRC
- ► Chrome Vanadium electric steel, oil-hardened and tempered

02 High Leverage Combination Pliers

DIN ISO 5746







- ► for heaviest duty
- ➤ 35% saving in power due to new, improved lever action
- with gripping zones for flat and round material, suitable for versatile use
- with cutting edges for soft, hard and piano wire
- long cutting edges for thicker cables
- cutting edges additionally induction hardened, cutting edge hardness approx. 64 HRC
- high grade special tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	С	utti	ing Ca	pacities	۵	δ
Length	Code	•	•	•					
mm	4003773-			Ø١	nm	ømm	ømm mr	n²	g
02 06 180	010012	chrome	insulated with two-colour	_ 2.	5	2.0	11.5 16	.0 24	0
200	010029	plated	dual component handles	2.	8	2.2	13.0 25	.0 33	5
225	010036		A 1000 V △ F VDE-tested	3.	0	2.5	14.0 25	.0 40	5
02 07 200	022299	chrome	plastic dipped insulated	2.	8	2.2	13.0 25	.0 38	5
225	022305	plated	★ 1000 V ♠ VDE-tested	3.	0	2.5	14.0 25	.0 49	0



KNIPEX High Leverage Combination Pliers with optimum position of the joint facilitate cutting as well as powerful gripping, bending and pulling.

Requires 35 % less effort

Cutting a hard wire of 2.0 mm dia. with a High Leverage Combination Plier of 180 mm length requires handforce of only 318 N (31.8 kp) instead of 486 N (48.6 kp) with a common Combination Plier of same length.

03 Combination Pliers

DIN ISO 5746







- with gripping zones for flat and round material, suitable for versatile use
- with cutting edges for soft and hard wire
- long cutting edges for thicker cables
- cutting edges additionally induction hardened, cutting edge hardness approx.
 ca. 60 HRC
- special tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Cutti	ng Ca	pacitie	s	47
Length	Code	•			•			
mm	4003773-			ømm	ømm	ømm n	nm²	g
03 06 160	021902	chrome	insulated with two-colour	3.1	2.0	10.0 1	6.0	220
180	021926	plated	dual component handles	3.4	2.2	12.0 1	6.0	265
200	033776		★ 1000 V	3.8	2.5	13.0 1	6.0	335
03 07 160	015307	chrome	plastic dipped insulated	3.1	2.0	10.0 1	6.0	265
180	015314	plated	A 1000 V A VDE-tested	3.4	2.2	12.0 1	6.0	305
200	015321			3.8	2.5	13.0 1	6.0	380
250	015345			3.8	2.5	15.0 2	5.0	610

11 Wire Strippers









Head Article-No. Handles EAN-Style **Stripping** △ capacities Code Length ø mm mm² AWG 4003773mm g 11 06 160 021933 insulated with two-colour 10.0 7.0 0 chrome 5.0 165 dual component handles plated WWW 11 07 160 015499 chrome plastic dipped insulated 5.0 10.0 7.0 195 A 1000 V A VDE-tested plated 11 17 160 plastic dipped insulated 015505 1 chrome 5.0 10.0 7.0 195 A 1000 V A VDE-tested plated

- ► for single, multiple and fine stranded conductors with plastic or rubber insulation max. 5.0 mm dia. or resp. 10.0 mm² cable cross section
- easy adjustment to the required diameter of the solid or stranded wire with knurled screw and lock nut
- special tool steel, oil-hardened and tempered

Style 0:

with opening spring

Style 1:

without opening spring

14 Diagonal Insulation Stripper





- ► the essential plier for electrical installation work
- ► precision stripping holes for single (solid) conductors of 1.5 and 2.5 mm²

n

► Vanadium electric steel, oil-hardened and tempered



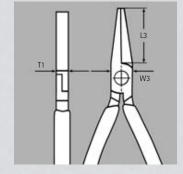
Multi-functional: cutting and stripping

Article-No.	EAN-	Head	Handles	Cutting c	apacities	7.7
Length	Code	•	•	•		
mm	4003773-			mm²	AWG	g
14 26 160	040279	chrome plated	insulated with two-colour dual component handles ★ 1000 V 🏤 VDE-tested	1.5 + 2.5	15 + 13	210



Article-No.	EAN-	Head	Handles	Din	nensions		47
Length	Code	•	•	L3	W3	T1	
mm	4003773-			mm	mm	mm	g
20 06 160	033783	chrome	insulated with two-colour	30.0	17.0	9.5	175
		plated	dual component handles ★ 1000 V 🏰 VDE-tested				

- ► short, flat jaws
- serrated gripping surfaces
- special tool steel, oil-hardened and tempered



22 Round Nose Pliers

22 06 160

8

DIN ISO 5745

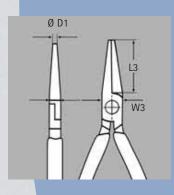


- ► for forming wire loops
- precision ground, short, round jaws
- ► smooth tips
- special tool steel, oil-hardened and tempered





Article-No.	EAN-	Head	Handles	Dime	nsions		₫
Length	Code	•	•	L3	W3	D1	
mm	4003773-			mm	mm	ø mm	g
22 06 160	033790	chrome plated	insulated with two-colour dual component handles ★ 1000 V ★ VDE-tested	30.0	18.0	3.0	170
22 07 160	015901	chrome plated	plastic dipped insulation 숲 1000 V 소녀 VDE-tested	30.0	18.0	3.0	205



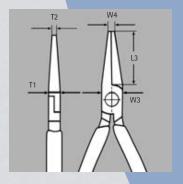
25 Chain Nose Side Cutting Pliers, Radio Pliers





- suitable for gripping and cutting work in precision mechanics
- pointed, half-round jaws
- serrated gripping surfaces
- ► with cutting edges for medium hard wire and hard wire

- cutting edges additionally induction hardened, cutting edge hardness approx. 61 HRC
- high grade special tool steel, oil-hardened and tempered



Article-No.	EAN-	Style	Head	Handles	Cutting ca	pacities	Dime	nsions	5			44
Length	Code						L3	W3	T1	W4	T2	
mm	4003773-				mm	mm	mm	mm	mm	mm	mm	g
25 06 160	033806	0	chrome	insulated with two-colour	2.5	1.6	50.0	16.5	9.5	3.0	2.5	150
			plated	dual component handles ★ 1000 V ◆ VDE-tested								
25 26 160	052111	2	chrome	insulated with two-colour	2.5	1.6	50.0	16.5	9.5	3.0	2.5	150
		∡_40°	plated	dual component handles								
		<u>X_</u> 40		A 1000 V A VDE-tested								

26 Chain Nose Side Cutting Pliers, Stork Beak Pliers



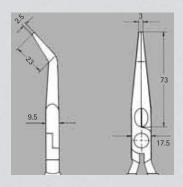


- high loadable, elastic precision points
- ► half-round, long jaws
- serrated gripping surfaces
- ▶ with cutting edges for medium hard wire max. dia. 3.2 mm and hard wire max. dia. 2.2 mm
- cutting edges additionally induction hardened, cutting edge hardness approx. 61 HRC
- Vanadium steel, oil-hardened and tempered

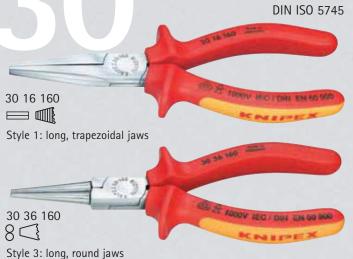


KNIPEX Snipe Nose Side Cutting Pliers (Stork Beak Pliers) are forged from Vanadium steel and are carefully hardened. The slim precision tips withstand high demands, particularly bending loads.

Article-No.	EAN-	Style	Head	Handles	47
Length	Code		•	•	
mm	4003773-				g
26 16 200	022831	1	chrome plated	insulated with two-colour dual component handles 숲 1000 V 金를 VDE-tested	205
26 17 200	016069		chrome plated	plastic dipped insulated 会 1000 V 企 会 VDE-tested	225
26 26 200	022855	2	chrome plated	insulated with two-colour dual component handles	205
26 27 200	016090	∡_40°	chrome plated	plastic dipped insulated 会 1000 V 全 VDE-tested	225



30 Long Nose Pliers without side cutter





- heavy duty and wear resisting
- different jaw styles
- Chrome Vanadium electric steel, oil-hardened and tempered

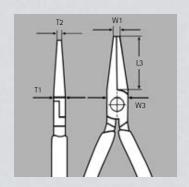
Style 1:

- long, trapezoidal jaws
- ► serrated gripping surfaces

Style 3:

- long, round jaws
- smooth gripping surfaces

1	Article-No.	EAN-	Style	Head	Handles	Dime	Dimensions				7.7
	Length	Code				L3	W3	T1	W4	T2	
	mm	4003773-				mm	mm	mm	mm	mm	g
3	30 16 160	001904	1	chrome	insulated with two-colour	46.5	16.5	9.5	3.0	5.0	155
				plated	dual component handles 会 1000 V 企命 VDE-tested						
3	30 36 160	002123	3	chrome	insulated with two-colour	41.0	16.5	9.5	5.0	2.5	145
			8	plated	dual component handles 会 1000 V 企会 VDE-tested						



 Θ

Style 2: 40° bent jaws

70 Diagonal Cutters

70 06 160





the indispensable diagonal cutter for all-round use

1000 V

- high quality material and precise workmanship for long service life
- precision cutting edges for soft and hard wire
- clean cutting at cutting edge tips, also in case of thin copper wires
- cutting edges additionally induction hardened, cutting edge hardness approx. 62 HRC

The cutting edges of KNIPEX Diagonal Cutters - made of Vanadium steel – have a long service life, are machined highly precise and are very sharp - for a clean cut of soft and hard wires.

- narrow head style for use in confined areas
- Vanadium electric steel, oil-hardened and tempered

Style 0:

with bevel

Style 2:

with small bevel

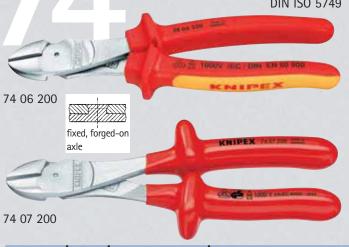


Slim head style and precise cut at blade tips: Advantageous when working in confined areas

Article-No. EAN-Head Handles **Cutting capacities** Style $\Delta \Delta$ Length Code mm 4003773ømm ømm g 70 06 125 018124 chrome insulated with two-colour 3.0 2.3 1.5 120 140 040293 plated dual component handles 4.0 1.8 160 **☆ 1000 V ♠** 160 021995 2.0 210 4.0 180 033813 VDE-tested 4.0 3.0 2.5 255 70 07 160 018155 chrome plastic-dipped 4.0 2.8 2.0 240 180 ↑ 1000 V ◆ VDE-tested 018179 plated 4.0 3.0 2.5 285 70 26 160 018223 insulated with two-colour chrome 4.0 210 plated dual component handles ★ 1000 V 🕮 🗗 VDE-tested

74 High Leverage Diagonal Cutters

DIN ISO 5749



749	★ 1000 V IEC 60900 DIN EN 60900
	 with forged-on axle for heaviest duty suitable for all types of wire including piano wire
	 high cutting performance wi minimum effort due to optimu co-ordination of the cutting

- ding piano wire cutting performance with num effort due to optimum rdination of the cutting edge angle, transmission ratio and ergonomic handle shape
- precision cutting edges additionally inductionhardened, cutting edge

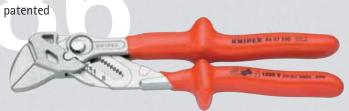
Article-	-No.	EAN-	Head	Handles	Cuttin	ıg capa	icities	47
L	ength	Code				•		
n	nm	4003773-			ømm	ømm	ø mm	g
74 06 1	160	040705	chrome	insulated with two-colour	3.4	2.5	2.0	215
1	180	022985	plated	dual component handles	3.8	2.7	2.2	260
2	200	033820		≙ 1000 V △△€	4.2	3.0	2.5	305
2	250	041955		VDE-tested	4.6	3.5	3.0	440
74 07 2	200	018414	chrome	plastic dipped insulated	4.2	3.0	2.5	340
2	250	018421	plated	★ 1000 V △ ◆ VDE-tested	4.6	3.5	3.0	475

The choice of material (Chrome Vanadium), lever ration and cutting edge angle mean that KNIPEX - High Leverage Diagonal Cutters are particularly designed for the cutting of hard wires. Fixed, forged-on articulated axle for work under continuous stress.



- hardness approx. 64 HRC ► the 250-mm-long diagonal cutter is suitable for copper conductors up to 16 mm² and aluminium conductors up to 35 mm²
- Chrome Vanadium electric steel, oil-hardened and tempered

86 Pliers Wrench, Pliers and Wrench in a single tool



86 07 250

piece

- excellent for gripping, holding, pressing and bending workpieces
 - ► for careful installation of finished-surface components
 - zero backlash jaw surface pressure prevents damage to edges of sensitive components
 - ► fast adjustment by pushing a button directly on the workpiece
 - no unintentional shift of the gripping jaws and no slipping of the joint
 - replaces a complete set of spanners
 - parallel jaws allow infinitely variable gripping of all widths to the specified maximum size



The patented Pliers Wrench is a multi functional fastening, gripping and holding tool with fast adjustment pushing a button. The high lever ratio, parallel jaws without profile and infinitely variable adjustment quarantee a secure and smooth gripping of the workpiece free from any backlash.

- ► the action of the jaws allows screwed connections to be tightened and released quickly using the ratchet principle
- lever transmission greater than 10 - 1 for strong gripping power
- also for tile breaking



1	Article-No.	EAN-	Head	Handles	Working		Dime	ensior	ıs	47
	Length	Code	•		Capacities	△ ¬¬	В1	B2	В3	
	mm	4003773-			Zoll	✓→mm	mm	mm	mm	g
1	86 07 250	065067	nickel	plastic dipped insulated	1 3/4	46	8.0	8.0	14.0	600
			plated	△ 1000 V , VDE-t	ested					

88 KNIPEX-"Alligator", Water Pump Pliers







- box-joint design: high stability because of double guide
- self-locking on pipes and nuts: no slipping on the workpiece; low handforce required
- guard prevents operators' fingers being pinched
- favourable lever action: optimum transmission of force
- gripping surfaces with special hardened teeth, teeth hardness approx. 61 HRC: low wear and secure gripping
- Chrome Vanadium electric steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Capacities		47
Length	Code	•		for pipes	for nuts	
mm	4003773-			O Inch	mm (across flats	s) g
88 06 250	039303	chrome	insulated with two-colour	1 1/2	36	370
		plated	dual component handles			
			♠ ★ 1000 V VDE-tested			
88 07 250	019343	chrome	plastic dipped insulated	1 1/2	36	415
300	022350	plated	△ 📤 🛕 1000 V VDE-tested	2	46	635



92 Precision Tweezers



会 1000 V IEC 60900 DIN EN 60900

- ► tested according IEC 60900: 2004
- ▶ plastic dipped insulated
- ▶ nickel plated

92 67 63

Model 92 27 61:

- ► for ultra fine mounting work
- extra fine tips
- ► straight pattern
- gripping surfaces mattfinished for optimum grip

Model 92 27 62:

- straight pattern
- gripping surfaces with fine transverse serration

Model 92 37 64:

- bent tips
- gripping surfaces with fine transverse serration

Model 92 67 63:

- straight pattern
- serrated gripping surfaces

92 27 62	92 37 64

Article-No.	EAN-	Finish		47
	Code		Length	
	4003773-		mm	g
92 27 61	054757	plastic dipped insulated IEC 60900: 2004 会 1000 V	130	30
92 27 62	054764		150	35
92 37 64	054856		150	35
92 67 63	054931		145	40

95 Cable Shears

EAN-

Code

4003773-

006305

Head

bright

polished

Article-No.

95 06 230

Length

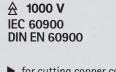
mm



Handles

plastic insulated

A 1000 V A VDE-tested



▶ for cutting copper conductors single wire up to 16 mm², multiple wire up to 50 mm², fine strand up to 70 mm² and aluminium conductors multiple wire up to 70 mm²

- ► not suitable for steel wire and hard drawn copper conductors
- precision ground, hardened blades
- easy cutting with one-hand operation due to high transmission ratio
- no crushing, slight deformation of the cable only
- ▶ with guard
- ► adjustable screw joint
- stainless special grade steel, oil-hardened and tempered

95 Cable Shears





- ► for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and hard drawn copper conductors
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- easy cutting with one-hand operation
- ▶ with guard
- adjustable screw joint, self-locking
- ► forged
- special tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Cuttir	g capac	ity	47
Length	Code	•		' @	•		
mm	4003773-			ø mm	mm²	AWG	g
95 16 165	039648	chrome	insulated with two-colour	15	50	1/0	255
		plated	dual component handles				
			A 1000 V A S VDE-tested				



Cut performed with a Diagonal Cutter: high effort required, inaccurate cut, considerable deforming and crushing of the cable



Cut performed with a Cable Shear: easy, clean cut without any deformation of the cable

95 Cable Shears with twin cutting edge







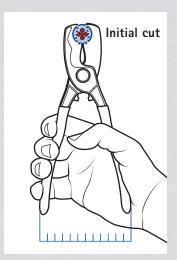
- ► for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and hard drawn copper conductors
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- easy cutting with one-hand operation
- initial and final cut (upper and lower blade) allows cables of up to 20 mm dia. to be cut
- ► low handforce required due to favourable lever ratio and new blade geometry
- with guard

Article-No.	EAN-	Head	Handles	Cuttin	g capa	city	47
Length	Code			.			
mm	4003773-			ø mm	mm²	AWG	g
95 16 200	026761	chrome	insulated with two-colour	20	70	2/0	345
		plated	dual component handles ★ 1000 V ▲ VDE- tested				
95 17 200	026952	chrome plated	plastic dipped insulated <u>A 1000 V</u> VDE- tested	20	70	2/0	380



KNIPEX Cable Shears with twin cutting edge are designed for cutting cables up to 20 mm dia. Even in case of large cable cross sections handles are always in a favourable position due to initial and final cut.

- adjustable screw joint, self-locking
- forged
- special tool steel, oil-hardened and tempered



Initial cut: using the upper cutting edge, an ergonomic handle opening is guaranteed even in case of large cable diameters



Final cut: if higher handforce is required, an additional cut can be done with the cutting edge profile near the joint. Initial cut with the upper cutting edge – final cut with the lower cutting edge

95 Cable Shears





- for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and wire ropes
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- ► low handforce required due to favourable lever ratio and new blade geometry
- ▶ short design, length only 500 mm
- ► low weight
- ▶ with guard
- ▶ adjustable screw joint
- cutter head forged from Vanadium steel, oil-hardened and tempered
- handles made of high resistant aluminium pipes

S	MPECIA	

The Cable Shears in compact and low weight construction (up to 1,000 g less in weight than comparable cable shears) for cable diameters up to 27 mm. Easy and clean cut due to high lever transmission and optimum blade geometry.

Requires 32 % less effort

Cutting a multiple wire cable 5 x 50 mmÇ with these high transmission KNIPEX Cable Shears (length 500 mm) requires handforce of only 560 N (56.0 kp) instead of 830 N (83.0 kp) with Cable Shears 95 21 600 (length 600 mm).

Article-No.	EAN-	Head	Handles	C	Cutting capacity		ity	47
Length	Code	•	•		@			
mm	4003773-			Ø	mm	mm²	AWG	g
95 17 500	026785	polished	plastic dipped insulated		27	150	5/0	1360





- for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and wire ropes
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation

- ► favourable transmission ratio due to double lever
- with guard
- ► adjustable screw joint
- replaceable, forged cutter head
- cutter head made of special tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Cutti	ng capa	city	₽
Length	Code	•		• (③		
mm	4003773-			ø mm	mm ²	AWG	g
95 17 500	026785	polished	plastic dipped insulated	27	150	5/0	1360
95 27 600	021797	polished	☆ 1000 V	27	150	5/0	2300
95 29 600	021803	spare cutter f	or 95 27 600				365

95 Cable Cutters, Ratchet Action

patented



95 36 280





- for cutting copper and aluminium cables, single and multiple wire
- not suitable for steel wire and wire ropes
- precision ground, hardened blades
- clean and smooth cut without crushing and deformation
- one-hand operation using ratchet principle

- ► little handforce required due to optimum transmission ratio
- two-stage ratchet drive for easy cutting
- simple handling as a result of low weight and compact design - can be used even in confined areas
- ▶ with guard
- special grade tool steel

Model 95 36 280:

► suitable for aluminium sector cable up to 4 x 150 mm²

Article-No.	EAN-	Head	Handles	С	uttin	ıg capac	ities	47
Length	Code	•		•	(•		
mm	4003773-			Ø	mm	mm²	MCM	g
95 36 250	026884	lacquered	insulated with two-colour	_ :	32	240	500	560
280	026891		dual component handles ★ 1000 V 🏖 🗗 VDE-tested		52	380	750	735
95 39 250	022244	spare moving	g blade					130
95 39 280	025283	spare moving	g blade					260



Ratchet principle and two-stage ratchet drive for easier cutting.

95 Wire Rope and Cable Cutter



会 1000 V IEC 60900 DIN EN 60900

- for wire ropes and steel rods, copper and aluminium cables
- suitable for cutting overhead cables with strain relief wire
- angular cutting blades allow cutting of single rope wire
- optimum transmission ratio for high cutting performance

- low weight
- replaceable cutter head
- high-strength aluminium handles
- cutter head made of special grade tool steel, oil-hardened and tempered

Article-No.	EAN-	Head	Handles	Cuttir	ıg capac	ities		Δ'Δ
Length	Code			'	0000 0000 0000	Fe		
mm	4003773-			mm²	ø mm	ø mm	AWG	g
95 77 600	025313	polished	plastic dipped insulated 会 1000 V VDE-tested	150	14	9	5/0 2	250
95 79 600	025337	spare cutter	head					

98 Open End Wrenches



DIN 7446 ☆

★ 1000 V
IEC 60900
DIN EN 60900

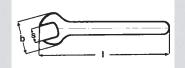
- ▶ jaw 15° angled
- ▶ basic tool chrome plated
- ► forged from Chrome Vanadium steel
- ► tested according to DIN EN/IEC 60900: 2004

98 00 14

Article- No.	Width across flats S	EAN- Code	Length I max*	Head width b max*	Head Hick a max*	ness
1101						
	mm	4003773-	mm	mm	mm	g
98 00	07	019824	105	20.0	4.0	30
	08	019831	105	22.0	4.0	30
	09	019848	105	24.0	4.0	35
	10	019893	105	27.0	5.0	40
	11	019909	120	30.0	5.5	60
	12	019923	125	32.0	5.5	60
	13	019930	130	34.0	6.5	65
	14	019947	135	35.0	6.5	80
	15	019954	145	37.0	7.0	85
	16	019961	155	38.0	7.0	110
	17	019978	155	42.0	8.0	110
	18	019985	160	44.0	8.0	140
	19	019992	165	47.0	9.0	150
	22	020004	190	52.0	9.0	200
	24	020011	210	56.0	9.0	280
	27	020028	215	63.0	9.0	310

Open End Wrenches Imperial sizes

Article-	EAN-	Width across	Length	
No.	Code	flats		2,7
	4003773-	INCH	INCH	g
98 00 1/4"	019886	1/4	4 1/4	30
98 00 5/16"	020073	5/16	4 1/4	35
98 00 3/8"	020042	3/8	4 1/4	40
98 00 7/16"	020097	7/16	4 3/4	60
98 00 1/2"	019879	1/2	5 1/2	60
98 00 9/16"	020110	9/16	6	85
98 00 5/8"	020080	5/8	6 1/2	110
98 00 3/4"	020035	3/4	7	150





98 Box Wrenches

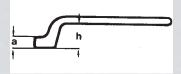


DIN 7447

<u>A</u> 1000 V IEC 60900 DIN EN 60900

- ▶ cranked
- ► basic tool chrome plated
- ► forged from Chrome Vanadium steel
- ► tested according to DIN EN/IEC 60900: 2004





98 01 14

Article- No.	Width across flats S	EAN- Code	Length I max*	Head width b max*	Head Hickness a max*	Depth of crank h max*	47
	mm	4003773-	mm	mm	mm	mm	g
98 01	07	020134	160	12.0	7	18	50
	08	020141	165	14.0	7	19	50
	09	020158	170	15.5	8	19	75
	10	020196	175	17.0	9	20	80
	11	020202	180	18.5	10	21	90
	12	020226	190	18.5	10	23	120
	13	020233	200	21.5	11	23	130
	14	020240	210	23.0	12	24	150
	15	020257	215	24.0	12	24	165
	16	020264	215	26.0	12	26	185
	17	020271	220	27.0	13	26	190
	18	020288	220	29.0	13	28	235
	19	020295	240	30.0	14	28	250
	22	020301	260	35.0	15	30	265
	24	020318	280	38.0	16	30	355

^{*} complies with the non-insulated basic tool

^{*} complies with the non-insulated basic tool





- ergonomically optimised dual component handle for fatigue reduced work and optimum transmission of force
- ► handle design prevents rolling
- ▶ VDE tested according to DIN EN/IEC 60900: 2004
- ► high-alloy chrome vanadium/molybdenum steel

Article- No.	Width across flats	EAN- Code	Length	Blade length	Handle length		44
	S mm	4003773-	mm	mm	mm	ømm	g
98 03	05.5	026082	230	125	105	11	70
	06	026099	230	125	105	12	70
	07	026105	235	125	110	14	110
	08	024095	235	125	110	15	110
	09	026112	235	125	110	16	110

Article- No.	Width across flats	EAN- Code	Length	Blade length	Handle length		₽.
	S mm	4003773-	mm	mm	mm	ømm	g
98 03	10	026129	235	125	110	17	110
	11	026136	235	125	110	19	160
	12	026143	235	125	110	20	160
	13	026150	235	125	110	21	165







- special tool steel, oil-hardened and tempered
- ▶ VDE tested according to DIN EN/IEC 60900: 2004

Article- No.	Width across flats	EAN- Code	Length	Handle width	Head dia.	47
	S mm	4003773-	mm	mm	ø mm	g
98 04	10	026167	200	155	19,5	350
	13	026198	200	155	23,5	375
	17	026211	200	155	28,5	450
	19	020424	200	155	31,0	570
	22	026228	200	155	34,5	615

Article- No.	Width across flats	EAN- Code	Length	Handle width	Head dia.	47
	S mm	4003773-	mm	mm	ømm	g
98 05	13	026273	300	155	23,5	435
	17	026297	300	155	28,5	580
	19	026303	300	155	31,0	750



DYEGS	
☆ 1000 V	
IEC 60900	
DIN EN 6090	

- ergonomically optimised dual component handle for fatigue reduced work and optimum transmission of force
- ► handle design prevents rolling
- ▶ VDE tested according to DIN EN/IEC 60900: 2004
- ► high-alloy chrome vanadium/molybdenum steel

Article- No.	Width across flats	EAN- Code	Length	Blade length	Length of non-insulated	Hand lengt	Handle length	
	S mm	4003773-	- mm	mm	blade mm	mm	47	
98 13	2.5	026334	175	75	15	100	40	
	3.0	026341	180	75	15	105	45	
	4.0	026358	180	75	15	105	40	

Article- No.	Width across flats		Length	Blade length	Length of non-insulated	Handle length	
	S mm	4003773	- mm	mm	blade mm	mm	7,7
98 13	5.0	026365	185	75	15	110	65
	6.0	026372	210	100	15	110	80

98 Screwdrivers with T-Handle





★ 1000 V
IEC 60900
DIN EN 60900

- ► special tool steel, oil-hardened and tempered
- ► tested according to DIN EN/IEC 60900: 2004

Article- No.	Width across flats	EAN- Code	Length	Length of non- insulated blade ±2	T-Handle width	5,7
	S mm	4003773-	mm	mm	mm	g
98 14	05	020431	120	9	90	195
	06	020448	120	10	90	200
	08	020455	120	11	90	270

Article- No.	Width across flats	EAN- Code	Length	Length of non- insulated blade ±2	T-Handle width	47
	S mm	4003773-	mm	mm	mm	g
98 15	05	020479	250	9	90	325
	06	020486	250	10	90	330
	08	020493	250	11	90	440

98 Screwdrivers

for slotted screws

DIN 7437



98 20 55



Article- No.	Blade width	EAN- Code	Blade thickness	Length	Blade length	Length of non- insulated blade	Handle length	47
	mm	4003773-	mm	mm	mm	mm	mm	g
98 20	2.5	062325	0.4	175	75	15	100	25
	3.0	062332	0.5	200	100	15	100	25
	3.5	024217	0.6	200	100	15	100	35
	4.0	026402	0.8	200	100	15	100	35
	5.5	024224	1.0	230	125	15	105	60
	6.5	026419	1.2	265	150	15	110	90
	8.0	024231	1.2	295	175	15	120	150
	10.0	026396	1.6	320	200	15	120	220
98 21	4.5	026426	0.8	285	180	15	105	60

- ergonomically optimised dual component handle for fatigue reduced work and optimum transmission of force
- ► handle design prevents rolling
- ► VDE tested according to DIN EN/IEC 60900: 2004
- ▶ high-alloy chrome vanadium/ molybdenum steel

Model 98 21 45:

especially for meter assembly with blade length of 180 mm

98 Screwdrivers

for cross recessed Phillips® screws

DIN 7438







Article- No.	Size	EAN- Code	Length	Blade length	Length of non- insulated blade		47
	No.	4003773-	mm	mm	mm	mm	g
98 24	00	026433	160	60	15	100	25
	01	026440	185	80	15	105	40
	02	026457	210	100	20	110	70
	03	026464	270	150	20	120	150
	04	026471	320	200	20	120	220

- ergonomically optimised dual component handle for fatigue reduced work and optimum transmission of force
- ► handle design prevents rolling
- VDE tested according to DIN EN/IEC 60900: 2004
- high-alloy chrome vanadium/ molybdenum steel

Phillips® is a registered Trademark of Phillips Screw Company

98 Screwdrivers

for cross recessed Pozidriv® screws







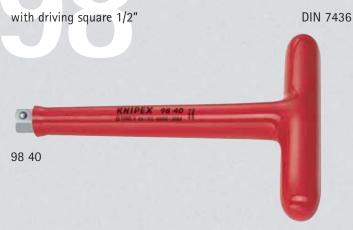


Article- No.	Size	EAN- Code	Length	Blade length	Length of non- insulated blade		2,7
	No.	4003773-	mm	mm	mm	mm	g
98 25	00	062370	160	60	15	100	40
	01	031260	185	80	15	105	50
	02	031277	210	100	20	110	65
	03	031284	270	150	20	120	140
	04	062387	320	200	20	120	170

- ergonomically optimised dual component handle for fatigue reduced work and optimum transmission of force
- ► handle design prevents rolling
- ► VDE tested according to DIN EN/IEC 60900: 2004
- ▶ high-alloy chrome vanadium/ molybdenum steel

Pozidriv® is a registered Trademark of Ind. Serv. Ltd.

98 T-Handle Drives



会 1000 V IEC 60900: 2004 DIN EN 60900

- ► for use with sockets
- basic tool chrome plated
- for quick, easy and secure locking of attached sockets
- special tool steel
- square oil-hardened and tempered
- ► tested according to EN/IEC 60900: 2004

Article-No.	EAN-	Handle length	Square drive		Δ'Δ
	Code			Length	
	4003773-	mm		mm	g
98 40	026501	165	1/2"	200	590

98 Reversible Ratchets



9 ★ 1000 V IEC 60900: 2004 DIN EN 60900

Square drive ර්ථ Length mm g

190

265

325

600

- for use with sockets
- reversible for clockwise and anti-clockwise directions
- extremely smooth action
- for quick, easy and secure locking of attached sockets
- ► Chrome Vanadium steel
- ► tested according to EN/IEC 60900: 2004

98 Extension Bars

EAN-

Code

4003773

026495

026518

with internal and driving square 3/8" or 1/2"

DIN 7434

会 1000 V IEC 60900: 2004 DIN EN 60900

3/8"

1/2"

KHIPEX MINUS |

98 35 125

Article-No.

98 31

98 41



98 35 250

Article-No.	EAN-	Square drive	7.7
Length	Code	'	
mm	4003773-		g
98 35 125	020530	3 8 (38")	140
250	020547	78 ₹8	140 260
98 45 125	020813	12	210
250	020820	<u> </u>	210 430

- ► for use with sockets
- with internal and external square
- ► forged
- for quick, easy and secure locking of attached sockets
- ► Chrome Vanadium steel
- tested according to EN/IEC 60900: 2004

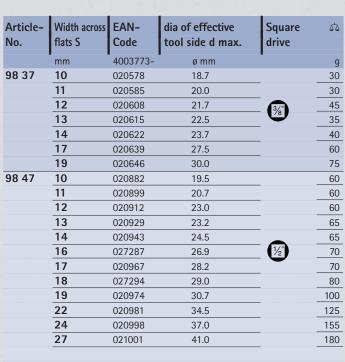
98 Hexagon Sockets

with internal square 3/8" or 1/2" for hexagon screws



98 37 17





DIN 7448

会 1000 V IEC 60900: 2004 DIN EN 60900

- for metric and imperial hexagonal head screws
- ▶ basic tool chrome plated
- ► Chrome Vanadium steel
- ► tested according to EN/IEC 60900: 2004

Hexagon Sockets imperial sizes

Article- No.	EAN- Code	Width across flats	Square drive	44
	4003773-	INCH		g
98 37 5/16"	020684	5/16		35
98 37 3/8"	020677	3/8		35
98 37 7/16"	020707	7/16		35
98 37 1/2"	020554	1/2	3/8"	40
98 37 9/16"	020721	9/16		40
98 37 5/8"	020691	5/8		40
98 37 3/4"	020660	3/4		70
98 47 1/2"	020875	1/2		55
98 47 9/16"	021094	9/16		60
98 47 5/8"	021063	5/8		60
98 47 11/16"	020905	11/16	1/2"	70
98 47 3/4"	021018	3/4		90
98 47 7/8"	021087	7/8		120
98 47 1"	020868	1		165
98 47 1"	020868	1		165

98 Screwdriver Socket Wrenches

with internal square 3/8" or 1/2" for hexagon screws



98 39 06



☆ 1000 V
IEC 60900: 2004
DIN EN 60900

- for metric internal hexagonal head screws
- ▶ basic tool chrome plated
- ► tested according to EN/IEC 60900: 2004

Article- No.	Width across flats S	EAN- Code	Length	Length of non- insulated blade :	Square ± 2 drive	2,7
	mm	4003773-	mm	mm	•	g
98 39	05	020776	75	9	(3/8")	55_
	06	020783	75	10	— V8	60
98 49	05	021155	75	9		90
	06	021162	75	10		90
	08	021179	75	11		90

98 Reversible Ratchet

with driving square 1/2"

DIN 7449

☆ 1000 V
IEC 60900: 2004
DIN EN 60900



98 42

Article-No.	EAN-	Square drive		47
	Code	•	Length	
	4003773-		mm	g
98 42	026525	1/2"	265	600

- reversible for clockwise and anti-clockwise directions
- easy and secure locking of attached sockets due to screw lock
- ► Chrome Vanadium steel
- tested according to EN/IEC 60900: 2004

98 Torque Wrench

with driving square 1/2", reversible



98 43

Article-No.	EAN-	Range of application	Square drive		47
'	Code			Length	
	4003773-			mm	g
98 43	026532	8 - 54 Nm	1/2"	325	900

<u>A</u> 1000 V IEC 60900: 2004 DIN EN 60900

- reversible for clockwise and anti-clockwise directions
- transparent insulated scale range 8 - 54 Nm
- lockable torque adjustment
- easy and secure locking of attached sockets due to screw lock
- ► calibration certificate included
- ► Chrome Vanadium steel
- ► tested according to EN/IEC 60900: 2004

98 Cable Knife



Article-No.	EAN-	Blade length		7,7
	Code		Length	
	4003773-	mm	mm	g
98 52	022541	50	180	70





with protective cap

- solid, fixed straight blade
- blade oil-hardened and tempered
- ► handle with slip guard
- ▶ transparent protective cap
- ► VDE tested according to DIN EN/IEC 60900: 2004

98 Dismantling Knife





- solid, fixed hook blade
- blade oil-hardened and tempered
- ► handle with slip guard
- transparent protective cap
- ► VDE tested according to DIN EN/IEC 60900: 2004

Article-No.	EAN-	Blade length	Radius		44
	Code			Length	
	4003773-	mm	mm	mm	g
98 53 03	026549	28	7	155	70



98 Dismantling Knife



Article-No.	EAN-	Blade length	Radius		2,2
	Code	•	•	Length	
	4003773-	mm	mm	mm	g
98 53 13	026556	50	40	180	70





with protective cap

- narrow, fixed hook blade, sickle shaped
- suitable for sector cables
- blade oil-hardened and tempered
- ► handle with slip guard
- transparent protective cap
- ➤ VDE tested according to DIN EN/IEC 60900: 2004

98 Cable Knife



Article-No.	EAN-	Blade length		47
	Code		Length	
	4003773-	mm	mm	g
98 54	026563	50	180	75





with protective cap

- ► solid, fixed straight blade
- blade oil-hardened and tempered
- back of the blade plastic coated to avoid short circuit
- ► handle with slip guard
- transparent protective cap
- ➤ VDE tested according to DIN EN/IEC 60900: 2004

98 Dismantling Knife



98 55

Article-No.	EAN-	Blade length		7.7
	Code		Length	
	4003773-	mm	mm	g
98 55	022558	38	155	90





with protective cap

- solid, fixed hook blade, sickle shaped
- with guide shoe at the blade point
- no damage of the conductor insulation
- blade made of stainless steel, vacuum hardened
- ► handle with slip guard
- transparent protective cap
- ➤ VDE tested according to DIN EN/IEC 60900: 2004

98 Cable Knife



98 56

Article-No.	EAN-	Blade length		Δ'Δ
	Code	•	Length	
	4003773-	mm	mm	g
98 56	026570	50	185	65
98 56 09	030829	spare blade		



- ► solid, fixed straight blade
- replaceable specially ground blade
- ▶ blade made of stainless steel
- with hinged blade guard, integrated in the handle, captive
- back of the blade plastic coated to avoid short circuit
- handle with slip guard
- ► VDE tested according to DIN EN/IEC 60900: 2004

98 Voltage Tester with load application



Article-No.	EAN-	Length	47
	Code		
	4003773-	mm	g
98 60 04	051961	1400	185



- ► LED display shows direct and alternating current levels 12, 24, 50, 120, 230, 400 and 750 V
- ▶ polarity test with direct voltage
- ► identifying the phase conductor against the protective conductor (PE) in alternating voltage
- ► load application to suppress inductive and capacitive voltage at $I_s \le 200 \text{ mA}$



► VDE tested according to DIN EN/IEC 61243-3

DUSPOL® is a registered Trademark of Benning, Elektrotechnik + Elektronik GmbH & Co. KG

98 Insulating Flat Nose Plier



Article-No.	EAN-	47
Length	Code	
mm	4003773-	g
98 62 200	021186	90

<u>★</u> 1000 V DIN EN 60900: 1997

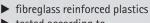
- especially for meter assembly and meter blocking
- fully insulating to avoid short circuits
- ► fibreglass reinforced plastics
- ► tested according to DIN EN 60900: 1997

98 Insulating Plastic Clamp



Article-No.	EAN-	Clamping capacity		47
	Code	•	Length	
	4003773-	mm	mm	g
98 64 02	021193	15	150	65

- ► for holding insulating mats in place
- with integrated spring
- fully insulating to avoid short circuits





98 Plastic Slip-On Caps, conical



Article-No.	EAN-	Conductor key		47
	Code	•	Length	
	4003773-		mm	g
98 65 01	021209	1	80	7
98 65 02	021216	2	80	7
98 65 03	021223	3	80	7

- ► for protection against bare live cable ends (max. 10 mm dia.)
- plastic
- tested according to VDE 0680/1



98 65 01

98 64 02

98 Self-Clamping Slip-On Caps



Article-No.	EAN-	Inside dia.		47
	Code	•	Length	
	4003773-	mm	mm	g
98 65 10	021230	10	80	10
98 65 20	021247	20	100	30
98 65 30	021261	30	110	40

- ► for protection against bare live cable ends
- plastic
- tested according to VDE 0680/1



98 65 30

98 Electricans' Gloves

☆ 1000 V DIN EN/IEC 60903

Article-No.	EAN-	Size	47
	Code		
	4003773-		g
98 65 40	021285	9	270
98 65 41	021292	10	280

- ► for protection when working live or close to live parts
- classification: 0
- tested according to **DIN EN/IEC 60903**



98 Insulating Mats

EAN-

Code 4003773-

026600

026617

Dimensions

500 x 500

1000 x 1000

from rubber

Article-No.

98 67 05

98 67 10



	47
Thickness	
mm	g
1.6	460

1.6

- for protection when working live or close to live parts
- tested according to VDE 0680/1



98 Junior Hacksaw

☆ 1000 V IEC 60900 DIN EN 60900

1940

Article-No.	EAN-	saw blade		47
	Code	Length	Length	
	4003773-	mm	mm	g
98 90	028321	150	240	170

- saw blade for metal and wood with 25 teeth per inch, exchangeable
- tested according to DIN EN/IEC 60900: 2004



98 Compact Tool Case, 17 parts

with insulated tools for working on electrical installations

☆ 1000 V IEC 60900 DIN EN 60900

Article-EAN-Contents: Article No. Code Article-No. Length/Size 4003773-98 99 11 026624 03 07 200 Combination Pliers 200 mm 70 07 160 Diagonal Cutter 160 mm 98 20 35 Screwdriver, for slotted screws 3.5 mm 98 20 40 Screwdriver, for slotted screws 4.0 mm 98 20 55 Screwdriver, for slotted screws 5.5 mm 98 24 00 Screwdriver, Phillips PH 0 98 42 Reversible Ratchet 265 mm 98 45 125 Extension Bar 125 mm 98 45 250 Extension Bar 250 mm 98 47 10 Hexagon Socket SW 10 mm 98 47 11 Hexagon Socket 1/2" SW 11 mm 98 47 12 Hexagon Socket Drive SW 12 mm 98 47 13 Hexagon Socket SW 13 mm 98 47 14 Hexagon Socket SW 14mm 98 47 17 Hexagon Socket SW 17 mm 98 47 19 Hexagon Socket SW 19 mm 98 52 Cable Knife 180 mm

shock-resistant plastic case

containing a range of conventional insulated KNIPEX tools for working on electrical installations, tested according to



98 Standard Tool Case, 26 parts

with insulated tools for working on electrical installations

Article-	EAN-		Description		
No.	Code	Article-No.			Length/Size
	4003773-		·		
98 99 12	026631	03 07 200	Combination Pliers		200 mm
		70 07 160	Diagonal Cutter		160 mm
		98 00 10	Open End Wrench		SW 10 mm
		98 00 11	Open End Wrench		SW 11 mm
		98 00 12	Open End Wrench		SW 12 mm
		98 00 13	Open End Wrench		SW 13 mm
		98 00 14	Open End Wrench		SW 14mm
		98 00 17	Open End Wrench		SW 17 mm
		98 00 19	Open End Wrench		SW 19 mm
		98 20 25	Screwdriver, for slotte	ed screws	2.5 mm
		98 20 35	Screwdriver, for slotte	ed screws	3.5 mm
		98 20 40	Screwdriver, for slotte	ed screws	4.0 mm
		98 20 55	Screwdriver, for slotte	ed screws	5.5 mm
		98 24 00	Screwdriver, Phillips		PH 00
		98 24 01	Screwdriver, Phillips		PH 01
		98 24 02	Screwdriver, Phillips		PH 02
		98 40	T-Handle Drive		200 mm
		98 47 10	Hexagon Socket		SW 10 mm
		98 47 11	Hexagon Socket	1/2"	SW 11 mm
		98 47 12	Hexagon Socket	Drive	SW 12 mm
		98 47 13	Hexagon Socket		SW 13 mm
		98 47 14	Hexagon Socket		SW 14mm
		98 47 17	Hexagon Socket		SW 17 mm
		98 47 19	Hexagon Socket		SW 19 mm
		98 52	Cable Knife		180 mm
		98 53 03	Dismantling Knife		155 mm

★ 1000 V IEC 60900 DIN EN 60900 ▶ shock-resistant plastic case
 ▶ containing a range of conventional insulated KNIPEX tools for working on electrical installations, tested according to DIN EN/IEC 60900: 2004



98 Tool Roll, 15 parts

with insulated tools for working on electrical installations

Article- No. Code					
98 99 13 026648 03 07 200 Combination Pliers 200 mm 11 17 160 Wire Stripper 160 mm 26 17 200 Snipe Nose Side 200 mm Cutting Pliers 70 07 160 Diagonal Cutter 160 mm 95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 13 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm	Article-	EAN-	Contents	Description	
98 99 13 026648 03 07 200 Combination Pliers 200 mm 11 17 160 Wire Stripper 160 mm 26 17 200 Snipe Nose Side 200 mm Cutting Pliers 70 07 160 Diagonal Cutter 160 mm 95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm	No.	Code	Article-No.		Length/Size
11 17 160 Wire Stripper 160 mm 26 17 200 Snipe Nose Side 200 mm Cutting Pliers 70 07 160 Diagonal Cutter 160 mm 95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm		4003773-			
26 17 200 Snipe Nose Side Cutting Pliers 200 mm 70 07 160 Diagonal Cutter 160 mm 95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm	98 99 13	026648	03 07 200	Combination Pliers	200 mm
Cutting Pliers 70 07 160 Diagonal Cutter 160 mm 95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			11 17 160	Wire Stripper	160 mm
70 07 160 Diagonal Cutter 160 mm 95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			26 17 200	Snipe Nose Side	200 mm
95 17 200 Cabel Shears 200 mm 98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm				Cutting Pliers	
98 00 10 Open End Wrench SW 10 mm 98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			70 07 160	Diagonal Cutter	160 mm
98 00 13 Open End Wrench SW 13 mm 98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			95 17 200	Cabel Shears	200 mm
98 00 14 Open End Wrench SW 14 mm 98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			98 00 10	Open End Wrench	SW 10 mm
98 00 17 Open End Wrench SW 17 mm 98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			98 00 13	Open End Wrench	SW 13 mm
98 00 19 Open End Wrench SW 19 mm 98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			98 00 14	Open End Wrench	SW 14 mm
98 20 25 Screwdriver 2.5 mm 98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			98 00 17	Open End Wrench	SW 17 mm
98 20 40 Screwdriver 4.0 mm 98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			98 00 19	Open End Wrench	SW 19 mm
98 20 55 Screwdriver 5.5 mm 98 20 65 Screwdriver 6.5 mm			98 20 25	Screwdriver	2.5 mm
98 20 65 Screwdriver 6.5 mm		_	98 20 40	Screwdriver	4.0 mm
			98 20 55	Screwdriver	5.5 mm
98 52 Cable Knife 180 mm		_	98 20 65	Screwdriver	6.5 mm
			98 52	Cable Knife	180 mm

★ 1000 V
IEC 60900
DIN EN 60900



- ► tool roll of hard-wearing polyester fabric
- with practical, adjustable quick-release fastener
- containing a range of conventional insulated KNIPEX tools for working on electrical installations,, tested according to DIN EN/IEC 60900: 2004



98 99 13

98 Universal Tool Case BIG TWIN, 46 parts

with insulated tools for working on electrical installations

Article-	EAN-	Contents	Article	
No.	Code	Article-No.		Length/Size
'	4003773-			2cgc, 3.2c
98 99 14		03 07 200	Combination Pliers	200 mm
		11 17 160	Wire Stripper	160 mm
		70 07 160	Diagonal Cutting Nipper	160 mm
		88 07 250	Water Pump Pliers "Alligator"	250 mm
		95 17 200	Cable Shear	200 mm
		98 00 10	Open End Wrench	SW 10 mm
		98 00 13	Open End Wrench	SW 13 mm
		98 00 14	Open End Wrench	SW 14mm
		98 00 17	Open End Wrench	SW 17 mm
		98 00 19	Open End Wrench	SW 19 mm
		98 00 22	Open End Wrench	SW 22 mm
		98 01 10	Box Wrench	SW 10 mm
		98 01 13	Box Wrench	SW 13 mm
		98 01 14	Box Wrench	SW 14mm
		98 01 17	Box Wrench	SW 17 mm
		98 01 19	Box Wrench	SW 19 mm
		98 01 22	Box Wrench	SW 22 mm
		98 20 25	Screwdriver, for slotted screws	2.5 mm
		98 20 40	Screwdriver, for slotted screws	4.0 mm
		98 20 55	Screwdriver, for slotted screws	5.5 mm
		98 20 65	Screwdriver, for slotted screws	6.5 mm
		98 40	T-Handle Drive	165 mm
		98 42	Reversible Ratchet	265 mm
		98 45 125	Extension Bar	125 mm
		98 45 250	Extension Bar	250 mm
		98 47 10	Hexagon Socket	SW 10 mm
		98 47 11	Hexagon Socket 1/2	SW 11 mm
		98 47 12	Hexagon Socket Drive	SW 12 mm
		98 47 13	Hexagon Socket Drive	SW 13 mm
		98 47 14	Hexagon Socket	SW 14mm
		98 47 17	Hexagon Socket	SW 17 mm
		98 47 19	Hexagon Socket	SW 19 mm
		98 47 22	Hexagon Socket	SW 22 mm
		98 47 24	Hexagon Socket	SW 24 mm
		98 52	Cable Knife	180 mm
		98 53 03	Dismantling Knife	155 mm
		98 64 02	6 Insulating Plastic Clamps	150 mm
		98 65 40	1 Pair Electricans' Gloves	Size 9
		98 67 05		500 x 1.6 mm
00 21 40 T	062981	Trolley, for	the rolling transport of Tool Cases	

★ 1000 V IEC 60900 DIN EN 60900

Model 98 99 14:

- ► ABS hard-shell construction, red, containing a range of conventional insulated KNIPEX tools for working on electrical installations, tested according to DIN EN/IEC 60900, as well as insulating mats, clamps and gloves
- sturdy aluminium frame with D-shape rings for belt and fix, sturdy centre board with multi-purpose push-in facilities by elastic loops and 12 small pockets
- comfortable handle and mounting device for a "Trolley" embedded in the bottom (available ordering ref. 00 21 40 T)
- metal hinges
- ▶ 30 kg maximum load

00 21 40 T

can be opened on one or both sides; bottom tray and cover

- can be opened independently
- ➤ stands securely in any opening position due to lid-holders and hinge mechanisms on both sides, that register in a position of 45° and 90°
- ► 3-digit lock and 2 clamp-locks for fixation of the cover
- removable document compartment and removable tool board, with 13 push-in compartments on one side
- ▶ 2 tilting locks to fix the bottom
- base tray, height 58 mm, can be subdivided by flexible inserts; cover plate with 6 large push-in compartments, can be fixed by push-button
- ext. dimensions (W x H x D): 490 x 220 x 410 mm int. dimensions (W x H x D): 445 x (105 x 105) x 350 mm



- ► telescopic handle for rolling transport
- ➤ applicable for cases: 00 21 40 LE Tool Case "BIG TWIN", 98 99 14 Universal Tool Case
- height adjustable handle with catch
- integrated mechanism for fixation to the case, for rapid assembly and removal
- with 2 smooth running rolls
- dimensions: 60 x 245 x 400 (1,000) mm (extended)







00 11 02/03 Control Cabinet Keys

for all standard cabinets and shut-off systems

00 11 03

		_				
Article-No.	EAN-	Capacity				7,7
	Code			O -	Length	
	4003773-	mm	mm	Ø mm	mm	g
00 11 02	048947	6/8	9	9	44	50
00 11 03	041658	5/6/8	9	9	76	80

- for control cabinets and shut-off systems in the supply of gas, water and electricity
- ► for technical installations in buildings, e. g. air conditioning and ventilation systems, shut-off valves, mains switch-boards, etc.
- ▶ square 6 + 8 mm
- ► triangular 9 mm
- two-way key bit 5 mm dia. (internal)/9 mm dia. (external)
- with bit insert: slot 1.0 x 7 mm and cross recess PH 2

- ▶ with adapter for 1/4" bits on securing chain
- ▶ additional bit adapter for 1/4" bits in one arm
- zinc die-casting

Model 00 11 02:

► short execution, total length 44 mm

Model 00 11 03:

- long execution, total length 76 mm
- additional square of 5 mm



Article-No.	EAN-	Capacit	у			7.7
	Code	'OI			Length	
	4003773-	mm	mm	mm	mm	g
00 11 04	048954	5/7/8	9	6/7/8/9	90	75

- key for heating, airconditioning, sanitary and building engineering, e. g. for door and window handles or for air bleeding heaters
- female square 5/7/8 mm
- ► triangular 10 mm
- ► male square in steps of 6/7/8/9 mm
- ▶ with bit insert: slot 1.0 x 7 mm and cross recess PH 2
- ► with adapter for 1/4" bits on securing chain

- ► total length: 90 mm
- ► additional bit adapter for 1/4" bits in one arm
- ▼ zinc die-casting

00 11 07 Pen-Style Control Cabinet Key



Article-No.	EAN-	Capacity	У			47
	Code	'OI		-0-	Length	
	4003773-	mm	mm	mm	mm	g
00 11 07	063018	5/6/8	9	9	145	140

- easy to carry pen-style control cabinet key with fastening clip
- four different key profiles can be utilized by swivelling the key holder
- for control cabinets and shutoff systems in the supply of gas, water and electricity
- for technical installations in buildings, e. g. air conditioning and ventilation systems, shutoff valves, mains switchboards, etc.
- ▶ female square 5; 6 + 8 mm
- triangular 9 mm
- ➤ two-way key bit 5 mm dia.(internal)/ 9 mm dia. (external)

- universal 1/4" bit adapter for standard bits (permanent magnet for retaining)
- ► additional bit adapter for 1/4" bits inside one key profile
- with bit insert: cross recess PH
 2 and possibility of safekeeping
 a second bit
- practical clip for safe transport
- corpus and fastening clip made from GRP plastic material; tool holder and key profiles zinc diecast

OO 11 O8 Pen-style Profi-Key for all standard shut-off systems OO 11 08

Article-No.	EAN-	Capacit	.у			47
	Code	'OI			Length	
	4003773-	mm	mm	mm	mm	g
00 11 08	063025	5/8	9	6/7/8/9	145	130

- easy to carry pen-style control cabinet key with fastening clip
- ► three different key profiles can be utilized by swivelling the key holder
- ► multi-purpose key for the builder
- key for heating, airconditioning, sanitary and building engineering, e. g. for door and window handles or for air bleeding heaters
- ► female square 5 + 8 mm
- triangular 9 mm
- ► male square in steps of 6/7/8/9 mm

for 6, 12 or 24 plierssmall size, minimum space

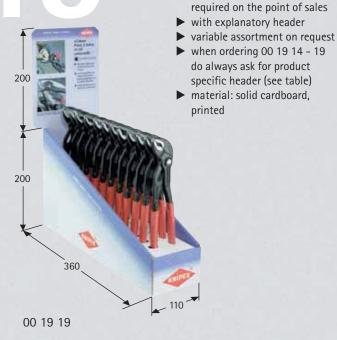
- universal 1/4" bit adapter for standard bits (permanent magnet for retaining)
- ► additional bit adapter for 1/4" bits inside one key profile
- with bit insert: cross recess PH
 2 and possibility of safekeeping
 a second bit
- ▶ practical clip for safe transport
- corpus and fastening clip made from GRP plastic material; tool holder and key profiles zinc diecast



200

00 19 17

00 19 Sales Displays



Article-No.	EAN-	Article					7,7
	Code	•	Units	Width	Height	Dept	h
	4003773-			mm	mm	mm	g
00 19 14	029625	86 03 180	6	110	200	200	1,820
00 19 17	027362	86 03 250	6	110	200	200	3,610
00 19 19	013365	87 01 250	12	110	200	360	3,990
C 320 00033	3	for 86 03	header avail	lable in D, GB, F, E,	NL, S, I		
C 320 00044	1	for 87 01	header avail	lable in D, GB, F, E,	NL, S, I		



Model 00 19 39:

► hook for sales displays see



C320 00033

C320 00044

00 19 Test Supports







00 19 21 T

00 19 20

00 19 20 T

Article-No.	EAN-				47
	Code	Width	Height	Deptl	h
	4003773-	mm	mm	mm	g
00 19 20	024637	230	165	310	1,350
00 19 20 T	0231192	148	225	135	750
00 19 21 T	027461	85	85	150	720
00 19 21 1	02/461	85	85	150	/20

Model 00 19 20:

- ► for testing the self-locking function of the "Alligator" and "Cobra"water pump pliers
- steady stand, high stability
- without pliers

Model 00 19 20 T:

- ► for testing the self-locking function of the "Alligator" and "Cobra" water pump pliers
- collapsible for space saving transport
- without pliers

Model 00 19 21 T:

- ► for testing the ratchet principle of Pliers Wrenches and multiple Slip Joint Spanner
- can be fixed on the wall
- without pliers

00 19 Rotary Sales Stand

- ► for 16 x 3 pliers
- attractive, compact rotary construction for the counter
- with 16 hooks 00 19 33
- assortment on request
- when ordering, do always ask for product detail labels
- without pliers
- ► material: sheet steel/ steel wire, white powder coated

Article-No.	EAN-			₫
	Code	Ø	Height	
	4003773-	mm	mm	g
00 19 28	032083	400	610	6,190

00 19 28



00 19 Sales Display for "Cobra" Water Pump Pliers

- ► attractive sales display for presentation of the complete "Cobra"-family
- ► solid style; can be fixed on tool bar systems, also suitable as counter display
- with integrated brochure holder for "Cobra" leaflets
- with transparent label holders
- please do always request leaflets and labels

- includes 3 "Cobras" each 87 01 150/180/250/300/400/560
- ► material: steel wire, silver powder coated

Article-No.	EAN-				₽
	Code	Width	Height	Depth	
	4003773-	mm	mm	mm	g
00 19 29	052340	610	445	250	20,000





- ► for 5 x 6 pliers
- small size, minimum space required on the point of sales
- with informative header and slide-in strip for product detail labels
- ► assortment on request
- when ordering, do always ask for product detail header (see table) and product detail labels
- without pliers
- material: steel wire, silver powder coated



C320 00110, general programme



C320 00187, Comfort



C320 00242, VDE



00 19 Sales Display





C320 00132, general programme



C320 00176, Comfort

Article-No.	EAN-	Header				7,7
	Code	1	Width	Height	Deptl	h
	4003773-		mm	mm	mm	g
00 19 25	014027		490	400	310	3,800
C320 00132		general programme				
C320 00176		Comfort, for pliers with two-color	ur dual component ha	ndles		
C320 00231		Precision Circlip Pliers 48/49				



C320 00231, Precision Circlip Pliers 48/49

- ► for 8 x 7 pliers
- solid style; can be fixed on tool bar systems, also suitable as counter display
- with informative header and slide-in strip
- assortment on request
- when ordering, do always ask for product detail header (see table)
- without pliers
- material: sheet steel/ steel wire, silver powder coated

00 19 Sales Display

- for 3 x 6 plierssolid style; can be fixed on tool bar systems, also suitable as counter display
- with header explanatory
- assortment on request
- when ordering, do always aks for product detail header (see table)
- without pliers

material: sheet steel/steel wire, silver powder coated

Model 00 19 34 3:

► for finish of pliers 0/1/3/4

Model 00 19 34 4:

► for finish of pliers 2/5/6

Article-No.	EAN-	Description				47
	Code		Width	Height	Dep	th
	4003773-		mm	mm	mm	g
00 19 34 3	054450	for finish 0/1/3/4	240	320	310	2,110
00 19 34 4	054467	for finish 2/5/6	240	320	310	2,110
C 320 00264		High Leverage Pliers				
C 320 00275		Precision Circlip Pliers 48	/49			
C 320 00286		Concretors' Nippers				
C 320 00297		"Cobra"/Plier Wrench				
C 320 00308		Insulated Pliers, VDE				
C 320 00319		Stripping and Crimping Pl	iers			
C 320 00330		general programme				
C 320 00352		Slip Joint Spanner				
C 320 00363		Self-Adjusting Insulation	Strippers			
C 320 00429		High Leverage Diagonal C	utters 74	12		
C 320 00451		Cobra ES				
C 320 00462		SmartGrip®				





C320 00264



C320 00275



C320 00286



C320 00297



C320 00308



C320 0319



C320 00330



C320 00352



C320 00363



C320 00429



C320 00451



C320 00462



0019 Tool Bar (Pegboard) and Accessories





KNIPEX COMFORT

L130 00198





Blister packaging

Carded Packaging:

- user friendly presentation
- space saving and informative
- possibility of testing the pliers
- material: solid and firm Clip, reinforced cardboard

00 19 30

Model 00 19 30:

- for the promotional, extensive presentation
- completely with supports, 5 peg boards, shelf and illuminated transparent advertising facia
- can be equipped either with self-service packaging pliers holders and/or sales displays
- ▶ with power cable and 230 V
- material: sheet steel / steel tubing, silver powder coated

Model 00 19 30 3:

▶ without illuminated facia

Model 00 19 30 66:

- ► for the space saving presentation
- completely with supports, 5 peg boards, shelf; without illuminated transparent advertising facia
- with magnetic advertising facia
- can be equipped either with self-service (carded) packaging,

pliers holders and/or sales displays

► material: sheet steel/ steel tubing, silver powder coated

Article-No.	EAN- Description					2,7
	Code	•	Width	Height	Dept	h
	4003773-		mm	mm	mm	g
00 19 30	024644	tool bar with illuminated facia	1000	2200	500	68,050
00 19 30 2	046783	illuminated facia	1000	200	400	11,450
00 19 30 21	066460	illuminated facia	1000	200	400	11,450
00 19 30 3	052524	tool bar without illuminated facia	1000	2200	500	56,600
00 19 30 6	034506	self-adhesive plastic label	1300	200		60
00 19 30 66	055211	tool bar without illuminated facia	660	2200	500	39,990
00 19 30 7	034810	advertising facia	1300	200		40
L130 00198	049234	Comfort-guidance label	980	100		60
L130 00209	049241	VDE-guidance label	980	100		60



00 19 30 66



00 19 30 2

00 19 30 21



Model 00 19 30 2/21:

- ▶ illuminated facia for tool bar systems
- solid aluminium frame with transparent plastic advertising facia, power cable and 230 V plug / series plug



Model 00 19 30 6:

- ► self-adhesive plastic label
- ► suitable for 1,000 and 1,300 mm wide promotional surfaces



Model 00 19 30 7

- ▶ advertising facia made of 0.5 mm sturdy plastic
- ➤ suitable for 1,000 and 1,300 mm wide promotional surfaces

0019 Show-Cabinets for Product Presentation

- with two glass sliding doors, lockable
- illumination unit with plug for series connection
- with power cable and 230 V plug
- material: aluminium section, silver colour

Model 00 19 30 VIT:

- ► hanging show-cabinet for assembly to tool bar systems
- with shelf, top cover and transparent advertising facia
- easy to assemble collapsible frame construction

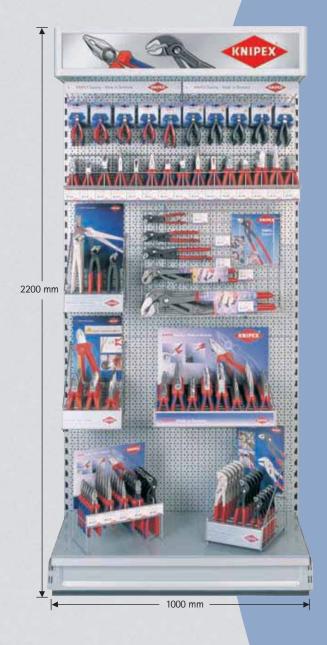
Model 00 19 30 VIT1:

- basic show-cabinet for assembly to tool bar systems
- with top cover and transparent advertising facia

Model 00 19 30 VIT2:

- unit show-cabinet for assembly to tool bar systems, for extension of basic showcabinet 00 19 30 VIT1
- with top cover and transparent advertising facia

Article-No.	EAN-	Description			
	Code		Width	Height	Depth
	4003773-		mm	mm	mm
00 19 30 VIT	034186	hanging show-cabinet	1000	1200	300
00 19 30 VIT1	048978	basic show-cabinet	1000	2070	470
00 19 30 VIT2	048985	unit show-cabinet	1000	2070	470



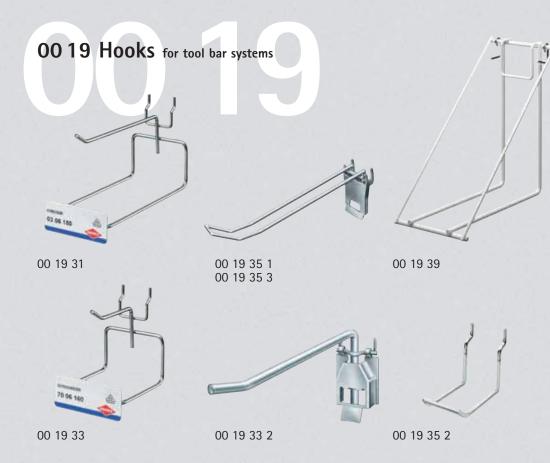




00 19 30 VIT

00 19 30 VIT 1

00 19 30 VIT 2



EAN-				47
Code		Hole spacing	Depth	
4003773-		mm	mm	g
014874	for 6 pliers	30	160	90
014881	for 3 pliers	30	90	70
042112	for large size water pump pliers, pipe wrenches, etc.	30	200	145
045168	for self-service packs	25	200	100
028284	for brochures and carded tools	30	50	10
051787	for self-service packs	30	200	100
034827	for sales displays 00 19 14 - 00 19 19	variable	200	320
	Code 4003773- 014874 014881 042112 045168 028284 051787	Code 4003773- 014874 for 6 pliers 014881 for 3 pliers 042112 for large size water pump pliers, pipe wrenches, etc. 045168 for self-service packs 028284 for brochures and carded tools 051787 for self-service packs	Code Hole spacing 4003773- mm 014874 for 6 pliers 30 014881 for 3 pliers 30 042112 for large size water pump pliers, pipe wrenches, etc. 30 045168 for self-service packs 25 028284 for brochures and carded tools 30 051787 for self-service packs 30	Code Hole spacing Depth 4003773- mm mm 014874 for 6 pliers 30 160 014881 for 3 pliers 30 90 042112 for large size water pump pliers, pipe wrenches, etc. 30 200 045168 for self-service packs 25 200 028284 for brochures and carded tools 30 50 051787 for self-service packs 30 200

00 19 Brochure Holder for tool bar systems

- ► for approx. 250 pcs. A4-size leaflets
- ► material: steel wire, silver powder coated

Article-No.	EAN-				47
	Code	Width	Height	Depth	
	4003773-	mm	mm	mm	g
00 19 36	024682	230	290	90	255

Model 00 19 31:

- ► 160 mm length
- ► for 6 pliers, with faceplate for label
- when ordering, do always ask for product detail labels

Model 00 19 33:

- ▶ 90 mm length
- for 3 pliers, with with faceplate for label
- when ordering, do always ask for product detail labels

Model 00 19 33 2:

- ▶ 200 mm length
- heavy duty for mounting pipe wrenches, etc.
- with pivoting clamping device for easy tastening and release

Model 00 19 35 1/3:

- ▶ 200 mm length
- ► for holding self-service packs with Euro standard perforations
- with pivoting clamping device for easy tastening and release

Model 00 19 35 2:

- ► 50 mm length
- ► for holding self-service carded packs and brochures with Euro standard perforations



Model 00 19 39:

- suspension device for sales displays 00 19 14; 00 19 17 for presentation on tool bar systems
- material: steel wire, silver powder coated



00 19 36

00 19 Pliers Racks for tool bar systems



00 19 34



00 19 34 1

Article-No.	EAN-					47
	Code		Width	Height	Depth	
	4003773-		mm	mm	mm	g
00 19 32	024651	for 3 x 6 pliers	195	98	175	380
00 19 34	024668	for 5 x 6 pliers	325	98	175	620
00 19 34 1	051824	for 5 x 6 pliers (carded)	480	200	225	1,000
00 19 34 2	052364	for 15 x 6 pliers	995	145	215	1 960



- ► for the space saving presentation of pliers on tool bar systems

 with slide-in strip for product
- labels
- when ordering, do always ask for product detail labels
 material: sheet steel/ wire,
- silver powder coated

Model 00 19 32:

► for 3 x 6 pliers

Model 00 19 34:

► for 5 x 6 pliers

Model 00 19 34 1:

- for 5 x 6 carded pliers
 with header sign

Model 00 19 34 2:

► for 15 x 6 pliers

00 19 Tool Roll, 11 parts



00 19 41

- ► for telecommunications and electrical engineers
- ► tool roll of hard-wearing polyester fabric
- with practical, adjustable quick release fastener
- contains 8 pliers and 3 scewdrivers
- ▶ pliers with chrome plated heads and two-colour dual component handles
- ► screwdrivers VDE tested according to DIN/IEC 60900 ★ 1000 V ♠

Article-No.	EAN-	Contents				47
	Code	'Article			Units	
	4003773-					g
00 19 41	024729					1,460
		03 05 160	Combination Pliers		1	
		11 15 160	Wire Stripper		1	
		25 05 160	Chain Nose Side Cutting Pliers		1	
		30 15 160	Long Nose Pliers, flat-wide		1	
		30 35 160	Long Nose Pliers, round		1	
		31 15 160	Needle Noser Pliers, straight		1	
		67 05 140	High Leverage End Cutting Nipper		1	
		70 05 140	Diagonal Cutter		1	
		98 20 25	Screwdriver, width of blade 2.5 mm	A 1000 V △	1	
		98 20 40	Screwdriver, width of blade 4.0 mm	A 1000 V 🕸 🗲	1	
		98 24 01	Cross Slot Screwdriver, Size 1 (Phillips)	A 1000 V △	1	



- ► for telecommunications and electrical engineers
- practical compartments for pliers, screwdrivers and tape rule
- with snap hooks and holder for insulation tape
- material: hard wearing, strong butt leather

Article-No.	EAN-	Arrangement	47
	Code		
	4003773-		g
00 19 48	024767	5 pockets	350

00 19 Circlip Pliers Sets, 4 parts



Contents

Article

44 11 J2

44 21 J21

46 11 A2

46 21 A21

48 11 J1

48 11 J2

49 11 A1

49 11 A2

00 19 56 Circlip Pliers

EAN-

Code

4003773-

030973

050056

Article-No.

00 19 56

00 19 57



00 19 57 Precision Circlip Pliers

Ø

 $\mathsf{m}\mathsf{m}$

19 - 60

19 - 60

19 - 60

19 - 60

12 - 25

19 - 60

10 - 25 19 - 60

- ▶ tool roll of hard-wearing polyester fabric
- with practical, adjustable quick release fastener



Model 00 19 56:

contains 4 common Circlip Pliers for internal and external circlips

Model 00 19 57:

₽

g

585

585

Units

contains common Precision Circlip Pliers for highest requirements

00 20 Precision Circlip Pliers Set, 4 parts

straight

straight

straight

straight

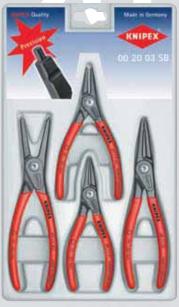
straight

straight

bent

bent

sturdy plastic packaging



MMM.

00 20 03 SB

Articla-No.	EAN-	Contents			
	Code	Article		Ø	Units
	4003773-			mm	·
00 20 03 SB	050100	48 11 J1	69	12 - 25	1
		48 11 J2		19 - 60	1
		49 11 A1	29	10 - 25	1
		49 11 A2		19 - 60	1

- attractive sales packaging with Euro standard perforation
- contains 4 common Precision Circlip Pliers for highest requirements
- sturdy plastic packaging, also suitable for storage of the pliers

00 20 Precision Circlip Pliers Set, 8 parts

sturdy plastic packaging





- attractive sales packaging with Euro standard perforation
- contains 8 common Precision Circlip Pliers for highest requirements
- sturdy plastic packaging, also suitable for storage of the pliers

00 20 04 SB

Article-No.	EAN-	Contents	Tipo			
	Code	Article			Ø	Units
	4003773-				mm	·
00 20 04 SB	062417	48 11 J1	straight	69	12 - 25	1
		48 11 J2	straight		19 - 60	1
		49 11 A1	straight	29	10 - 25	1
		49 11 A2	straight	\cup	19 - 60	1
		48 21 J11	bent	69	12 - 25	1
		48 21 J21	bent		19 - 60	1
		49 21 A11	bent	29	12 - 25	1
		49 21 A21	bent	\cup	19 - 60	1

00 20 Pliers Sets









00 20 10

00 20 11

00 20 12

00 20 13

Article-No. EAN-Description Contents $\Delta \Delta$ Code Article 4003773g 00 20 10 010388 Power Pack 02 01 180 940 74 01 160 87 01 250 00 20 11 012405 Assembly Pack 03 02 180 750 26 12 200 70 02 160 00 20 12 012412 Elektro Pack 03 06 180 ☆ 1000 V △ 800 26 16 200 <u>A</u> 1000 V △ 70 06 160 A 1000 V △ 🕒 00 20 13 043287 VDE Tool Set 26 16 200 A 1000 V △ 🕰 885 70 06 160 A 1000 V △ 🕒 WERA 160i 0.6 x 3.5 x 100 A 1000 V △ 🕒 WERA 160i 1.0 x 5.5 x 125 A 1000 V △ 🖎 WERA 162i PH2 x 100 ★ 1000 V 金

- ► attractive sales packaging with Euro standard perforation
- material: sturdy cardboard packaging, printed

Modell 00 20 10:

pliers with polished heads and plastic coated handles

Modell 00 20 11:

pliers with two-colour dual component handles

Modell 00 20 12:

► all pliers VDE-tested according to DIN EN/IEC 60900 ★ 1000 V, pliers finish 6

Modell 00 20 13:

► all tools VDE-tested according to DIN EN/IEC 60900 ★ 1000 V, pliers finish 6

00 20 Electronics Pliers Sets

for working on electronic components









Model 00 20 16:

- 7 parts, contains 6 electronics pliers and one precision tweezer
- case made of hard-wearing polyester fabric, pliers are held by elastic band, with zip fastener

Model 00 20 17:

- ► 6 parts, contains 6 ESD electronics pliers, electrically discharging version
- case made of hard-wearing polyester fabric, pliers are held by elastic band, with zip fastener

Model 00 20 18:

- ▶ 8 parts, contains 2 electronics pliers and 6 electronics screwdrivers
- practical storage box, shockresistant plastic, with foam insert

Model 00 20 18 ESD:

- ▶ 8 parts, contains 2 electronics pliers and 6 electronics scewdrivers, ESD electrically discharging version
- practical storage box, shockresistant plastic, with foam insert

Article-No.	EAN-	Contents	Description	47
	Code	Article	•	
	4003773-			g
00 20 16	022619	35 12 115 35 22 115 35 32 115 64 32 120	Case for Electronics Pliers	610
		77 02 115 77 42 115 92 34 36		
00 20 17	031222	35 12 115 ESD 35 22 115 ESD 35 42 115 ESD	Case for Electronics Pliers ESD	590
		64 32 120 ESD 77 02 115 ESD 77 32 115 ESD		
00 20 18	033073	35 22 115 77 02 115	Case for Electronics Pliers	450
		Screwdrivers 0,4 x 2,5/0,5 x 3/0,6 x 3,5/0,8 x 4,0 mm - PH 0/PH 1		
00 20 18 ESD	051848	35 22 115 ESD 77 02 115 ESD	Case for Electronics Pliers ESD	450
		Screwdrivers ESD 0,4 x 2,5/0,5 x 3/0,6 x 3,5/0,8 x 4,0 mm - PH 0/PH 1		

00 20 Precision Electronics Pliers Sets

for working on electronic components



Model 00 20 16 P:

79 02 120 ESD | 79 02 125 ESD | 79 42 125 ESD

- ► 6 parts, contains 6 precision electronics pliers
- case made of hard-wearing polyester fabric, pliers are held by elastic band, with zip fastener





Model 00 20 16 P ESD:

- ► 6 parts, contains 6 ESD precision electronics pliers, electrically discharging version
- case made of hard-wearing polyester fabric, pliers are held by elastic band, with zip fastener

Article-No.	EAN-	Contents	Description	7.7
	Code	Article		
	4003773-			g
00 20 16 P	063223	34 12 130 34 22 130 34 32 130 79 02 120 79 02 125 79 42 125	Case for Precision Electronics Pliers	610
00 20 16 PESD	063230	34 12 130 ESD 34 22 130 ESD 34 32 130 ESD	Case forPrecision Electronics Pliers ESD	610

00 20 Tool Box, 4 parts

with VDE tools

- high quality, versatile, shockresistant plastic case
- ► foam insert with honeycomb structure for variable equipment
- ▶ outside dimensions (H x W x D): 65 x 327 x 275 mm

Model 00 20 15:

► all pliers VDE tested according to DIN/IEC 60900 会 1000 V , pliers finish 6

Model 00 21 15 LE:

without tools



00 20 15

00 21 01 TL

Article-No.	EAN-	Contents	47
	Code	*Article	
	4003773-		g
00 20 15	024804	03 06 180	1,490
		11 06 160 ★ 1000 V ♠♠	
		26 16 200 ★ 1000 V ♠€	
		70 06 160 ★ 1000 V ♠€	_
00 21 15 LE	045175	empty	532

00 21 Tool Bag, 24 parts

for electrical contractors, Top Model

Article-No. Code Article-No. Contents Description Manufacturer Nominal size 4003773- 00 21 01 TL 032694 6,56 6,56 03 06 180 Combination Pliers KNIPEX Scripter 180 mm 11 06 160 Wire Stripper KNIPEX Scripter 160 mm 25 06 160 Chain Nose Side Cutting Pliers KNIPEX Scripter 160 mm 70 06 160 Diagonal Cutter KNIPEX Scripter 180 mm 98 52 SB Cable knife KNIPEX Scripter 180 mm 160i Insulated Screwdriver for slotted screws WERA 2.5 x 80 mm 3.5 x 100 mm 5.5 x 125 mm 6.5 x 150 mm 162i Insulated Screwdriver for Phillips screws WERA PH 1/80 mm PH 2/100 mm PH 2/100 mm 16 20 165 Cable Knife with hook blade KNIPEX 165 mm 98 90 S Junior Hack Saw KNIPEX 230 mm	
A003773- O0 21 01 TL O32694	
03 06 180 Combination Pliers KNIPEX 180 mm	
03 06 180 Combination Pliers KNIPEX 180 mm	g
11 06 160 Wire Stripper KNIPEX 160 mm	0
25 06 160 Chain Nose Side Cutting Pliers KNIPEX 160 mm	
70 06 160 Diagonal Cutter KNIPEX 160 mm	
98 52 SB Cable knife KNIPEX 180 mm	
160i	
1000 V 1EC 60900 for slotted screws 3.5 x 100 mm 5.5 x 125 mm 6.5 x 150 mm 6.5 x 150 mm 6.5 x 150 mm 6.5 x 150 mm 6.7 x 150 mm 6.5 x 1	
For slotted screws 3.5 x 100 mm 5.5 x 125 mm 6.5 x 150 mm	
DIN EN 60900	
6.5 x 150 mm 162i Insulated Screwdriver WERA PH 1/80 mm for Phillips screws PH 2/100 mm 16 20 165 Cable Knife with hook blade KNIPEX 165 mm	
for Phillips screws PH 2/100 mm 16 20 165 Cable Knife with hook blade KNIPEX 165 mm	
16 20 165 Cable Knife with hook blade KNIPEX 165 mm	
98 90 S Junior Hack Saw KNIPEX 230 mm	
334 Screwdriver WERA <u>6.0 x 125 mm</u>	
for slotted screws 6.5 x 150 mm	
4115 Voltage Tester with load application WERA 3.0 x 65 mm	
_101 Fitters Hammer PICARD 300 g	
30490800 Chisel Hammer PICARD 800 g	
75040-015 Water Brush PICARD 40 mm	
75075-040 Painter's Knife PICARD 40 mm	
71510-000 Metre Rule (inch rule) PICARD 2 m	
3612521 Electrician's Chisel RENNSTEIG 250 x 10 mm	
3403001 Bolster Chisel RENNSTEIG 300 mm	
7165/50 Plaster Duct NÖLLE 125 x 90 mm	

► contains 24 brand name quality tools, partly VDE tested according to to DIN/IEC 60900 & 1000 V

- comfortable bag of hardwearing leather, with front bag, adjustable retaining loops and belt
- ▶ with galvanised steel base tray
- edges of the tool case reinforced with aluminium
- ► internal dimensions (W x H x D): 420 x 250 x 160 mm

00 21 Tool Box, 7 parts

for electrical contractors

- high quality, versatile, shockresistant plastic case
- ► foam insert with honeycomb structure for variable equipment
- ▶ outside dimensions (H x W x D): 65 x 327 x 275 mm

Model 00 21 15:

► all pliers and screwdrivers except Water Pump Pliers VDE tested according to DIN/IEC 60900 ★ 1000 V

00 21 02 SL

Model 00 21 15 LE:

without tools



Article-No.	EAN- Code	Contents Article	₫
	4003773-		g
00 21 15	042853	03 06 180 <u>★</u> 1000 V △★	1,520
		26 16 200 ★ 1000 V ♠€	
		70 06 160 ★ 1000 V ★	
		88 03 180	
		WERA 0.4 x 2.5 ★ 1000 V 🏤 😝	
		WERA 0.8 x 4.0 ★ 1000 V ▲ ●	
		WERA PH1	
00 21 15 LE	045175	empty	532

00 21 Tool Bag, 24 parts

apprentices tool bag for electrical contractors

Article-	EAN-	Contents	Contents	Manu-	Nominal	1
No.	Code	Article-No.	Description	facturer	size	2,7
	4003773-	•		•	•	g
00 21 02 SL	050162					6,960
		98 52 SB	Cable Knife	KNIPEX	180 mm	
^ =		660i	Insulated Screwdriver	WERA	2.5 x 80 mm	
OYE CS			for slotted screws		3.5 x 100 mm	
☆ 1000 V					5.5 x 125 mm	
_					6.5 x 150 mm	
IEC 60900 DIN EN 6090	00	662i	Insulated Screwdriver	WERA	PH 1/80 mm	
DIN EN 603	00		for Phillips screws		PH 2/100 mm	
		665i	Insulated Screwdriver	WERA	PZ 1/80 mm	
			for Pozidriv screws		PZ 2/100 mm	
		03 05 180	Combination pliers	KNIPEX	180 mm	
		25 05 160	Chain Nose Side Cutting Pliers	KNIPEX	160 mm	
		70 05 160	Diagonal Cutter	KNIPEX	160 mm	
		11 05 160	Wire Stripper	KNIPEX	160 mm	
		16 20 165	Cable Knife with hook blade	KNIPEX	165 mm	
		98 90 S	Junior Hack Saw	KNIPEX	230 mm	
		247	Voltage Tester	WERA	3.5 x 100 mm	
		0000 101	Fitters Hammer	PICARD	300 g	
		0000 401	Mallet	PICARD	1000 g	
		75040-015	Water Brush	PICARD	40 mm	
		75075-040	Painter's Knife	PICARD	40 mm	
		71501-024	Carpenter's Pencil	PICARD	24 cm	
		3612521	Electrician's Chisel	RENNSTEIG	250 x 10 mm	
		3402501	Bolster Chisel	RENNSTEIG	250 mm	
		7165/50	Plaster Duct	NÖLLE	125 x 90 mm	
00 21 02 LE	057499	Tool Bag "Nev	V Classic Basic", empty			2.600

- ► tool bag with side walls and bottom tray made of impact and moisture resistant double wall HDPE material
- ► front, rear and lid made of calf leather, black
- semi-fold-out front with adjustable loops and exterior document compartment
- ► front additionally reinforced with aluminium brackets
- ► rear wall with injection-moulded loop holder with 11 loops
- ▶ handle
- ► internal dimensions (W x H x D): 420 x 250 x 160 mm

Model 00 21 02 SL:

► contains 24 brand name quality tools, partly VDE tested according to DIN/IEC 60900 ★ 1000 V

Model 00 21 02 LE:

without tools

00 21 Tool Case "Elektro", 20 parts



- ► heavy duty ABS material, black
- with circumferential double aluminium frame
- register hinges working as lid holder
- strong, ergonomic handle
- ▶ 2 tilting locks, lockable
- ▶ 1 removable tool board in the lid with 15 push-in compartments on the bottom side and 6 big push-in compartment and a clamp compartment (400 mm width) on the lid side, fixed by push-button
- ▶ base tray, height 58 mm, can be subdivided by flxible inserts; cover plate with 6 large push-in compartments, can be fixed by push-button
- Cover and tool plate made of Con-Pearl™ material
- ▶ 20 kg maximum load
- ► internal dimension (W x H x D): 465 x 170 x 310 mm

Model 00 21 20:

➤ with 20 brand name tools, partly VDE tested according to DIN/IEC 60900 ★ 1000 V

Model 00 21 20 LE:

without tools

Article- No.	EAN- Code	Contents Article-No.	Description	Manu- facturer	Nominal size	57
	4003773-	•		•	•	g
00 21 20	052166					7,750
		03 06 180	Combination Pliers	KNIPEX	180 mm	
		26 16 200	Snipe Nose Side Cutting Pliers	KNIPEX	200 mm	
N. C		26 26 200	Snipe Nose Side Cutting Pliers, bent	KNIPEX	200 mm	
		70 06 160	Diagonal Cutter	KNIPEX	160 mm	
<u></u> 1000 \	/	74 06 200	High Leverage Diagonal Cutter	KNIPEX	200 mm	
IEC 60900		95 16 200	Cable Shear	KNIPEX	200 mm	
DIN EN 60	900	98 56	Cable Knife	KNIPEX	185 mm	
		_160i	Insulated Screwdriver			
			for slotted screws	WERA	2.5 x 0.4 mm	
			for slotted screws	WERA	4.0 x 0.8 mm	
			for slotted screws	WERA	5.5 x 1.0 mm	
			for slotted screws	WERA	6.5 x 1.2 mm	
		162i	for Phillips screws	WERA	PH 1 x 80 mm	
			for Phillips screws	WERA	PH 2 x 100 mm	
		165i	for Pozidriv screws	WERA	PZ 1 x 80 mm	
			for Pozidriv screws	WERA	PZ 2 x 100 mm	
		12 40 200	Self-Adjusting Insulation Strippers	KNIPEX	200 mm	
		16 80 125 SB	Universal Stripping tool	KNIPEX	125 mm	
		86 03 180	Pliers Wrench	KNIPEX	180 mm	
		87 03 250	"Cobra" Water Pump Pliers	KNIPEX	250 mm	
		247	Voltage Tester	WERA	3 x 70 mm	
00 21 20 L	E 044567	Tool Case "Sta	ndard", empty			3,60

00 21 Tool Case

for the E-CHECK®, 23 parts





- ► contains 23 brand name quality tools, partly VDE tested according to DIN/IEC 60900 **☆ 1000 v**
- ► hard-wearing ABS hard-shell construction with aluminium frame and circular buffer protection
- ▶ document compartment and pen holding straps
- 1 removable tool plate, with elastic loops on both sides
- 1 cover plate with elastic loops and tool protection cloth
- ► large base tray with variable separations (e.g. for measuring and testing devices). Internal dimensions: 420 x 320 x 85 mm
- sturdy metal locks and 3-digitlock
- strong, ergonomic handle
- ► feet on two sides
- colour: silver / aluminium look

250 mm

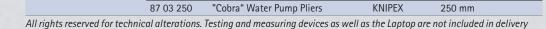
KNIPEX







Article- No.	EAN- Code	Contents Article-No.	Contents Tools	Manu- facturer	Nominal size	47
	4003773-					g
00 21 30	051084					6,560
		03 06 180	Combination Pliers	KNIPEX	180 mm	
)	26 16 200	Snipe Nose Side Cutting Pliers	KNIPEX	200 mm	
)	26 26 200	Snipe Nose Side Cutting Pliers, bent	KNIPEX	200 mm	
☆ 1000 V	1	70 06 125	Diagonal Cutter	KNIPEX	125 mm	
IEC 60900		70 06 160	Diagonal Cutter	KNIPEX	160 mm	
DIN EN 60	900	92 27 62	Precision Tweezers	KNIPEX	150 mm	
		98 56	Cable Knife, with protecting cap	KNIPEX	180 mm	
		160i	Insulated Screwdriver			
			for slotted screws	WERA	2.5 x 80 mm	
			for slotted screws	WERA	3.5 x 100 mm	
			for slotted screws	WERA	4.0 x 100 mm	
			for slotted screws	WERA	5.5 x 125 mm	
			for slotted screws	WERA	6.5 x 150 mm	
			for slotted screws	WERA	8.0 x 175 mm	
		162i	for Phillips screws	WERA	PH 0 x 80 mm	
			for Phillips screws	WERA	PH 1 x 80 mm	
			for Phillips screws	WERA	PH 2 x 100 mm	
		165i	for Pozidriv screws	WERA	PZ 1 x 80 mm	
			for Pozidriv screws	WERA	PZ 2 x 100 mm	
		00 11 03	Control Cabinet Key	KNIPEX	76 mm	
		12 40 200	Self-Adjusting Insulation Stripper	KNIPEX	200 mm	
		16 80 125 SB	Universal Stripping Tool	KNIPEX	125 mm	
		86 03 180	Pliers Wrench	KNIPEX	180 mm	



87 03 250





The spacious base tray is suitable for holding measuring and testing devices or a Laptop

00 21 Tool Case "Basic", empty

00 21 05 LE

00 21 32 LE



heavy duty ABS material, black

- circumferential aluminium frame with D-shape rings for the annexed shoulder strap
- ➤ 3-digit lock and 2 clamp-locks for fixation of the cover
- strong, ergonomic handle
- metal hinges
- ► lid holder with hinge-joint mechanism
- document compartment in the cover

Article-No.	EAN-	Dimension external		Dimension externa	al
	Code	(internal) width	(internal) height	(internal) depth	47
	4003773-	mm	mm	mm	g
00 21 05 LE	056904	465 (440)	200 (180)	410 (350)	5,700

- removable tool board in the lid with 9 push-in compartments and an elastic loop on the lid side; with 10 slim and one large push in compartments on the bottom side
- ▶ base tray, height 55 mm, can be subdivided by inserts; cover plate with 12 large push-in compartments and a flat compartment, can be fixed by push-button
- ▶ load capacity: 15 kg
- exterior dimensions (W x H x D): 465 x 200 x 410 mm interior dimensions (W x H x D): 440 x 180 x 350 mm

00 21 Tool Case "Classic II", empty



► heavy duty ABS material, black

- with circumferential double aluminium frame
- register hinges working as lid holder
- sturdy multi-component handle with grip recesses
- ▶ 2 tilting locks, lockable
- document compartment in the cover
- ► 1 removable tool board in the lid with CP-7 tool holder (thickness 11 mm) on the bottom side
- ▶ 1 tool board in the lid with CP-7 tool holder (thickness 11 mm) on the lid side and CP-7 tool holder (thickness 15 mm) on the bottom side
- base tray, height 58 mm, can be subdivided by flexible inserts; cover plate with CP-7 tool holder (thickness 25 mm) on the lid side, can be fixed by push-button
- cover and tool plate made of Con-Pearl® material
- ▶ 30 kg maximum load
- internal dimension (W x H x D): 465 x 170 x 310 mm

Article-No.	EAN- Code	Dimension external (internal) width	Dimension external (internal) height	Dimension externa (internal) depth	ΔΔ
	4003773-	mm	mm	mm	g
00 21 32 LE	057536	480 (460)	180 (165)	365 (300	4,690

00 21 Tool Case "Classic III", empty



- ► heavy duty ABS material, black
- extra large in height, width and depth
- with circumferential double aluminium frame
- register hinges working as lid holder
- sturdy multi-component handle with grip recesses
- ▶ 2 tilting locks, lockable
- document compartment in the cover

	1 tool board in the lid with 13
	push-in compartments on the
	bottom side and 12 push-in
	compartments as well as a
	clamp compartment (width 400
	mm) on the lid side

- base tray, height 88 mm, can be subdivided by flexible inserts; cover plate with 15 push-in compartments and a clamp compartment (width 400 mm), can be fixed by 2 push-buttons
- cover and tool plate made of Con-Pearl® material
- ▶ 30 kg maximum load
- external dimensions (W x H x D): 490 x 205 x 420 mm internal dimensions (W x H x D): 470 x 180 x 360 mm

Article-No.	EAN-	Dimension external	Dimension external	Dimension extern	al
	Code	(internal) width	(internal) height	(internal) depth	7.7
	4003773-	mm	mm	mm	g
00 21 33 LE	057543	490 (470)	205 (180)	420 (360)	5,090

00 21 33 LE

00 21 Tool Case "BIG Twin"





Model 00 21 40 T:

- ► telescopic handle for rolling transport
- applicable for cases: 00 21 40 LE Tool Case "BIG Twin", 98 99 14 Universal Tool Case
- ► height adjustable handle with catch
- integrated mechanism for fixation to the case, for rapid assembly and removal
- with 2 smooth running rolls
- ► dimensions: 60 x 245 x 400 (1,000) mm (extended)

Model 00 21 40 LE:

- ▶ heavy duty ABS material, black
- ➤ sturdy aluminium frame with D-shape rings for belt and fix, sturdy centre board with multipurpose push-in facilities by elastic loops and 12 small pockets
- comfortable handle and mounting device for a "Trolley" embedded in the bottom (available ordering ref. 00 21 40 T)
- metal hinges
- ▶ 30 kg maximum load
- can be opened on one or both sides; bottom tray and cover can be opened independently
- ▶ stands securely in any opening position due to lid-holders and hinge mechanisms on both sides, that register in a position of 45° and 90°
- ► 3-digit lock and 2 clamp-locks for fixation of the cover
- removable document compartment and removable tool board, with 13 push-in compartments on one side
- ▶ 2 tilting locks to fix the bottom
- base tray, height 58 mm, can be subdivided by flexible inserts; cover plate with 6 large push-in compartments, can be fixed by push-button
- ext. dimensions (W x H x D): 490 x 255 x 410 mm int. dimensions (W x H x D) : 445 x (105 + 105) x 350 mm



Upper closure, lockable: opening one side of the case



Lateral closure, lockable: opening the other side of the case





Article-No.	EAN- Code	Dimension external (internal)
	4003773-	mm
00 21 40 LE	057673	255 (105 +105)
00 21 40 T	062981	60 x 245 x 400 (1000) mm (extended)





"BIG Twin" assembled with Trolley

00 11 03	145 145 145 146 146 146 147 147 147 147 148 148 148 147 150 150 150 150 150 151 151 151 151 151	02 06 180 02 06 200 02 06 225 02 07 200 02 07 225 03 00 180 03 00 250 03 01 140 03 01 160 03 01 200 03 02 180 03 02 180 03 02 180 03 02 180 03 02 180 03 05 140 03 05 160 03 05 180 03 06 180 03 06 200 03 07 180 03 07 200 03 07 180 03 07 200 03 07 180 03 07 200 03 07 160 03 07 180 03 07 200 03 07 160 03 07 160 01 1 160 11 107 160 11 17 160 11 192 140 12 11 180	13 13 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	15 61 160 15 81 160 16 20 16 SB 16 20 16 SB 16 20 16 SB 16 20 18 SB 16 20 18 SB 16 29 165 16 30 135 SB 16 39 135 16 40 150 16 49 150 16 60 05 SB 16 65 125 SB 16 85 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 01 200 20 02 140 20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 02 140 22 02 160 22 01 180 22 02 140 22 02 160 22 01 180 22 02 140 22 05 160 22 05 160 22 07 160 23 01 140 22 07 160 23 01 140	24 24 25 25 25 25 25 26 26 26 26 27 27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30 30 30 30 30 30	30 21 160 30 21 190 30 23 140 30 25 140 30 25 160 30 25 190 30 31 140 30 31 160 30 35 140 30 35 160 30 36 160 31 11 160 31 25 160 31 21 160 31 25 160 32 21 135 32 21 135 33 21 115 35 21 115 35 21 115 35 22 115 35 22 115 35 32 115	37 37 37 37 38 38 38 39 38	44 11 J1 44 11 J2 44 11 J3 44 11 J4 44 13 J0 44 13 J1 44 13 J2 44 13 J3 44 13 J4 44 19 J5 44 19 J6 44 20 J51 44 20 J51 44 21 J01 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 21 J31 44 21 J31 44 23 J11 44 21 J31 44 21 J41 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A0 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48	50 00 180 50 00 210 50 00 225 50 00 250 50 00 300 50 01 130 50 01 180 50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 12 115 64 12 115 64 12 115 64 32 120 64 42 115 64 42 115 64 42 115 64 42 115 64 52 115 64 62 120 64 62 120 64 62 120	58 58 59 58 58 58	74 01 180 74 01 200 74 01 250 74 02 140 74 02 160 74 02 180 74 02 200 74 05 140 74 05 160 74 05 180 74 06 200 74 06 250 74 06 250 74 07 200 74 07 250 74 12 160 74 12 180 74 21 160 74 21 200 74 22 200 74 22 200 74 21 200 74 22 200 74 21 250 75 22 125 75 32 125 75 32 125 76 01 125 76 03 125	644 644 644 644 644 644 644 644 644 644
00 11 04 14 14 14 10 11 07 14 16 10 11 08 14 16 10 19 17 14 16 10 19 19 19 14 16 10 19 20 T 17 16 10 19 20 T 18 10 10 20 T 18 10 20	145 146 146 146 146 147 147 147 148 148 149 150 150 150 150 150 150 151 151 151 151	02 06 225 02 07 200 02 07 225 03 00 180 03 00 200 03 00 250 03 01 140 03 01 160 03 01 200 03 02 250 03 02 160 03 02 180 03 02 180 03 02 180 03 05 180 03 05 180 03 05 180 03 06 180 03 06 180 03 07 180 03 07 180 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 10 160 11 10 160 11 11 15 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160	13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	16 20 16 SB 16 20 165 SB 16 20 165 SB 16 20 28 SB 16 29 165 16 30 135 SB 16 39 135 16 40 150 16 60 05 SB 16 60 100 SB 16 65 125 SB 16 85 125 SB 19 01 130 19 03 130 19 03 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 01 200 20 02 140 20 02 160 20 05 160 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 01 180 22 01 140 22 01 160 22 01 180 22 01 140 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 05 160 22 06 160 22 07 160 23 01 140	25 25 25 25 25 25 26 26 26 27 27 27 27 29 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	30 23 140 30 25 140 30 25 160 30 25 190 30 31 140 30 31 160 30 35 160 30 35 160 30 36 160 31 11 160 31 15 160 31 21 160 31 25 160 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 33 01 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 34 32 130 34 32 130 35 11 115 35 12 115 35 21 115 35 22 115 ESD 35 31 115 35 32 115	35 35 35 35 35 35 35 35 35 35 34 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 37 38 38 38 38 39 38 39 39 39 39 39 39 39 39 39 39 39 39 39	44 11 J3 44 11 J4 44 13 J0 44 13 J1 44 13 J2 44 13 J3 44 19 J5 44 19 J6 44 20 J51 44 20 J51 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 21 J41 44 23 J11 44 23 J11 44 23 J11 44 29 J51 44 29 J51 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A0 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48	50 00 225 50 00 250 50 00 300 50 01 130 50 01 160 50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 32 120 64 42 115 64 32 120 64 42 115 64 42 115 64 42 115 64 42 115 64 42 115 64 32 120 ESE 64 42 115 64 52 115 64 52 115 64 52 115	52 52 52 52 52 52 52 52 52 52 52 53 53 53 53 53 53 57 57 57 58 58 58 58 59 58 58 58	74 01 250 74 02 140 74 02 160 74 02 180 74 02 200 74 02 250 74 05 140 74 05 180 74 05 250 74 06 180 74 06 180 74 06 250 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 21 200 74 22 200 74 91 250 75 02 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 64 64 64 64 64 64 64 64 64 64 64 6
00 11 07	145 146 146 146 147 147 147 148 148 149 150 150 150 150 150 151 151 151 151 152 153 152 153 153 153 153 153 153 153 153 153 153	02 07 200 02 07 225 03 00 180 03 00 200 03 00 250 03 01 140 03 01 160 03 01 250 03 01 180 03 02 260 03 02 160 03 02 180 03 05 160 03 05 180 03 05 200 03 06 160 03 06 180 03 07 250 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 10 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160	13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	16 20 165 SB 16 20 28 SB 16 29 165 16 30 135 SB 16 39 135 16 40 150 16 49 150 16 60 05 SB 16 65 125 SB 16 85 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 160 20 05 160 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 01 125 22 01 140 22 01 160 22 01 125 22 01 140 22 01 160 22 01 125 22 01 140 22 02 160 22 05 140 22 05 160 22 05 160 22 07 160 23 01 140	25 25 25 25 25 26 26 26 27 27 27 27 29 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	30 25 140 30 25 160 30 25 190 30 31 140 30 31 160 30 35 140 30 35 160 30 36 160 31 11 160 31 15 160 31 21 160 32 11 135 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 32 11 135 33 01 160 34 12 130 34 12 130 34 12 130 34 12 130 35 11 115 35 12 115 35 12 115 35 22 115 ESD 35 31 115 35 32 115	35 35 35 35 35 35 35 35 35 34 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 37 37 38 38 38 39 38	44 11 J4 44 13 J0 44 13 J1 44 13 J2 44 13 J3 44 13 J3 44 19 J5 44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J01 44 21 J11 44 21 J31 44 21 J41 44 23 J11 44 23 J11 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A0 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48	50 00 250 50 00 300 50 01 130 50 01 160 50 01 180 50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 32 120 64 32 120 64 42 115 64 42 115 64 42 115 64 42 115 64 42 115 64 42 115 64 32 120 64 42 115 64 42 115 64 42 115 64 42 115	52 52 52 52 52 52 52 52 52 52	74 02 140 74 02 160 74 02 180 74 02 200 74 02 250 74 05 140 74 05 160 74 05 180 74 05 250 74 06 160 74 06 180 74 07 200 74 07 200 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 22 125 75 32 125 76 01 125 76 03 125	644 644 644 644 644 644 644 644 644 644
00 11 08	146 146 146 147 147 148 148 147 150 150 150 150 151 151 151 151 151 151	02 07 225 03 00 180 03 00 200 03 00 250 03 01 140 03 01 160 03 01 180 03 01 250 03 02 160 03 02 160 03 02 180 03 02 180 03 05 180 03 05 180 03 05 180 03 06 200 03 06 160 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 10 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160	13 14 14 14 14 14 14 14 14 14 14 14 14 14	16 20 28 SB 16 29 165 16 30 135 SB 16 39 135 16 40 150 16 49 150 16 60 05 SB 16 60 100 SB 16 65 125 SB 16 80 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 01 180 22 01 180 22 01 180 22 01 140 22 01 160 22 01 180 22 01 140 22 01 160 22 01 180 22 01 140 22 01 160 22 01 180 22 02 140 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	25 25 25 26 26 26 27 27 27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	30 25 160 30 25 190 30 31 140 30 31 160 30 35 140 30 35 140 30 35 160 30 36 160 31 11 160 31 15 160 31 21 160 32 21 135 32 21 135 32 21 135 32 21 135 32 21 135 34 12 130 34 12 130 ESD 34 22 130 34 22 130 34 22 130 35 11 115 35 12 115 35 21 115 35 22 115 ESD 35 31 115 35 32 115	35 35 35 35 35 35 35 34 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 38 38 38 39	44 13 J0 44 13 J1 44 13 J2 44 13 J3 44 19 J5 44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 23 J31 44 23 J31 44 29 J61 45 10 170 45 21 200 46 10 A5 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4	48 48 48 48 48 48 48 48 48 48	50 00 300 50 01 130 50 01 160 50 01 180 50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 22 115 64 32 120 64 32 120 64 42 115 64 32 120 64 42 115 64 42 115 64 42 115 64 42 115 64 52 115 64 52 115 64 52 115	52 52 52 52 52 52 52 52 52 53 53 53 53 57 57 58 58 58 59 58 58 59	74 02 160 74 02 180 74 02 200 74 02 250 74 05 140 74 05 160 74 05 180 74 05 250 74 06 160 74 06 180 74 06 250 74 07 250 74 12 180 74 12 180 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 76 01 125 76 03 125	64 64 64 64 64 64 64 64 64 64 64 64 64 6
00 19 14	146 146 147 147 148 148 147 150 150 150 150 151 151 151 151 151 151	03 00 180 03 00 200 03 00 250 03 01 140 03 01 160 03 01 180 03 01 250 03 01 250 03 02 160 03 02 180 03 02 200 03 05 140 03 05 180 03 05 180 03 06 200 03 06 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 15 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160	14 14 14 14 14 14 14 14 14 14 14 14 14 1	16 29 165 16 30 135 SB 16 39 135 16 40 150 16 49 150 16 60 05 SB 16 60 100 SB 16 65 125 SB 16 80 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 01 140 22 01 160 22 01 125 22 01 140 22 01 160 22 07 160 23 01 140	25 25 25 26 26 26 27 27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30	30 25 190 30 31 140 30 31 160 30 33 160 30 35 140 30 35 160 30 36 160 31 11 160 31 15 160 31 21 160 32 21 135 32 21 135 32 21 135 32 31 135 33 01 160 33 03 160 34 12 130 ESD 34 22 130 34 22 130 34 22 130 34 32 130 ESD 35 11 115 35 12 115 35 12 115 35 22 115 35 22 115 35 22 115 35 22 115 35 32 115	35 35 35 35 35 35 35 34 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 37 37 38 38 38 39 38	44 13 J1 44 13 J2 44 13 J3 44 13 J4 44 19 J5 44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 23 J31 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 10 00 46 10 A5 46 11 A0 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48	50 01 130 50 01 160 50 01 180 50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 32 120 64 32 120 64 32 120 64 32 120 64 32 120 64 42 115 64 42 115 64 42 115 64 32 120 64 42 115 64 42 115 64 42 115 64 42 115	52 52 52 52 52 52 52 52 53 53 53 53 57 57 58 58 58 59 58 58 59 58	74 02 180 74 02 200 74 02 250 74 05 140 74 05 160 74 05 180 74 05 250 74 06 160 74 06 180 74 06 250 74 07 250 74 12 180 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 32 125 75 52 125 76 01 125 76 03 125	644 644 644 644 644 644 644 644 644 645 645
00 19 17	146 146 147 147 147 147 148 148 147 150 150 150 150 150 151 151 151 151 151	03 00 200 03 00 250 03 01 140 03 01 160 03 01 180 03 01 250 03 02 160 03 02 180 03 02 200 03 05 140 03 05 180 03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 15 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 192 140	14 14 14 14 14 14 14 14 14 14 14 14 14 1	16 30 135 SB 16 39 135 16 40 150 16 49 150 16 60 05 SB 16 60 100 SB 16 65 125 SB 16 80 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 06 160 20 01 125 22 01 140 22 01 160 22 01 180 22 01 140 22 01 160 22 01 180 22 01 140 22 01 160 22 01 180 22 02 140 22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 07 160 23 01 140	25 25 26 26 26 27 27 27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	30 31 140 30 31 160 30 33 160 30 35 140 30 35 160 31 35 160 31 11 160 31 15 160 31 21 160 32 11 135 32 21 135 32 21 135 32 21 135 32 31 135 33 01 160 34 12 130 34 12 130 34 12 130 ESD 34 22 130 ESD 35 11 115 35 12 115 35 12 115 35 22 115 ESD 35 31 115 35 32 115	35 35 35 35 35 35 34 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 37 37 37 37 38 38 38 39 38	44 13 J2 44 13 J3 44 13 J4 44 19 J5 44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 23 J31 44 23 J31 44 23 J31 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48	50 01 160 50 01 180 50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 32 120 64 32 120	52 52 52 52 52 52 52 53 53 53 53 53 57 57 57 58 58 58 58 59 58 58 59	74 02 200 74 02 250 74 05 140 74 05 160 74 05 180 74 05 250 74 06 160 74 06 180 74 06 250 74 07 200 74 07 250 74 12 160 74 21 200 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 52 125 76 01 125 76 03 125	644 644 644 644 644 644 644 644 645 645
00 19 20 14 00 19 21 T 12 00 19 24 14 00 19 25 14 00 19 28 14 00 19 28 14 00 19 29 14 00 19 30 15 00 19 30 2 15 00 19 30 2 15 00 19 30 3 15 00 19 30 6 15 00 19 30 VIT 15 00 19 30 VIT 2 15 00 19 30 VIT 3 15 00 19 30 VIT 3 15 00 19 30 VIT 3 15 00 19 31 15 00 19 32 15 00 19 34 1 15 00 19 34 1 15 00 19 34 1 15 00 19 34 1 15 00 19 34 1 15 00 19 34 1 15 00 19 34 1 15 00 19 35 1 15 00 19 35 1 15 00 19 35 1 15 00 19 35 3 15 00 19 36 15 00 19 37 15 00 19 38 15 00 19 38 15 00 19 39 15 00 19 39 15 00 19 30 15	147 147 147 148 148 147 150 150 150 150 150 150 151 151 151 151	03 01 140 03 01 160 03 01 180 03 01 200 03 01 250 03 02 160 03 02 180 03 02 180 03 05 140 03 05 160 03 05 180 03 06 160 03 06 180 03 07 160 03 07 180 03 07 200 03 07 200 03 07 160 03 07 160 09 01 160 11 01 160 11 07 160 11 12 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 192 140	14 14 14 14 14 14 14 14 14 14 14 14 14 1	16 40 150 16 49 150 16 60 05 SB 16 60 100 SB 16 65 125 SB 16 80 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 180 20 02 140 20 02 160 20 05 140 20 05 160 20 01 125 20 11 140 22 01 160 22 01 125 22 01 140 22 02 160 22 01 125 22 01 140 22 01 160 22 01 160 22 01 160 22 02 140 22 02 160 22 05 160 22 05 160 22 06 160 22 07 160 23 01 140	26 26 26 27 27 27 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	30 33 160 30 35 140 30 35 160 30 36 160 31 11 160 31 15 160 31 21 160 32 11 135 32 21 135 32 21 135 32 23 135 32 31 135 33 01 160 34 12 130 34 12 130 34 12 130 34 12 130 ESD 34 32 130 ESD 35 11 115 35 12 115 35 21 115 35 22 115 ESD 35 31 115 35 32 115	35 35 35 35 34 34 34 36 36 36 36 36 37 37 37 37 37 37 38 38 39 38	44 13 J4 44 19 J5 44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J11 44 21 J11 44 23 J11 44 23 J11 44 23 J21 44 23 J21 44 23 J31 44 29 J51 44 29 J61 45 10 170 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48 48 47 47 49 49 49 49	50 01 210 50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 22 115 64 32 120 64 32 120 64 32 120 ESE 64 42 115 64 52 115 64 52 115	52 52 52 52 52 53 53 53 53 53 57 57 57 58 58 58 58 59 58 58	74 05 140 74 05 160 74 05 180 74 05 200 74 05 250 74 06 160 74 06 180 74 07 200 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 64 64 64 64 64 64 64 64 65 65 65 65 65
00 19 20 T	147 147 148 148 149 147 147 147 147 147 150 150 150 150 150 151 151 151 152 153 152 153 153 153 153 153 153 153 153 153 153	03 01 160 03 01 180 03 01 180 03 01 200 03 02 160 03 02 180 03 02 180 03 05 140 03 05 160 03 05 180 03 06 160 03 06 180 03 07 160 03 07 180 03 07 200 03 07 200 03 07 160 03 07 160 04 10 160 11 05 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 14 14 14 14 14 14 1	16 49 150 16 60 05 SB 16 60 100 SB 16 65 125 SB 16 80 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	26 26 27 27 27 27 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	30 35 140 30 35 160 30 36 160 31 11 160 31 15 160 31 21 160 31 25 160 32 11 135 32 21 135 32 23 135 32 31 135 33 01 160 34 12 130 34 12 130 ESD 34 32 130 34 22 130 34 32 130 34 32 130 35 11 115 35 12 115 35 22 115 ESD 35 31 115 35 32 115	35 35 35 34 34 34 36 36 36 36 36 37 37 37 37 37 37 38 38 38 39	44 19 J5 44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 21 J41 44 23 J11 44 23 J21 44 23 J21 44 29 J51 44 29 J61 45 10 170 46 10 A5 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48	50 01 225 50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 12 115 64 12 115 64 12 115 64 32 120 64 32 120 64 32 120 64 32 120 65 32 120 66 42 115 66 42 115 66 42 115	52 52 52 52 53 53 53 53 53 57 57 57 58 58 58 58 59 58 58 59	74 05 160 74 05 180 74 05 200 74 05 250 74 06 160 74 06 180 74 06 250 74 07 200 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 22 125 75 32 125 76 01 125 76 03 125	644 644 644 644 644 644 644 645 655 655
00 19 21 T	147 148 148 147 147 150 150 150 150 150 150 151 151 151 151	03 01 180 03 01 200 03 01 250 03 02 160 03 02 180 03 02 200 03 05 140 03 05 160 03 05 180 03 06 200 03 06 160 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 10 160 11 10 160 11 10 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 14 14 14 14 14 14 1	16 60 05 SB 16 60 100 SB 16 65 125 SB 16 80 125 SB 16 85 125 SB 19 01 130 19 03 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 05 160 22 01 125 22 01 140 22 01 160 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 01 180 22 02 160 22 05 140 22 05 160 22 05 160 22 06 160 22 07 160 23 01 140	26 27 27 27 27 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30 30	30 35 160 30 36 160 31 11 160 31 15 160 31 25 160 32 11 135 32 21 135 32 23 135 32 31 135 33 01 160 34 12 130 34 12 130 34 12 130 ESD 34 22 130 ESD 35 11 115 35 12 115 35 22 115 ESD 35 31 115 35 32 115	35 35 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 38 38 39 38	44 19 J6 44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 21 J41 44 23 J11 44 23 J21 44 23 J31 44 29 J61 45 10 170 45 10 A6 46 11 A0 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48 47 47 47 49 49 49 49	50 01 250 50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 12 115 64 12 115 64 32 120 64 32 120 64 42 115 64 42 115 64 42 115 64 52 115 64 52 115 64 52 115	52 52 52 53 53 53 53 57 57 58 58 58 58 59 58 58 59 58 58	74 05 180 74 05 200 74 05 250 74 06 160 74 06 180 74 06 250 74 07 250 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 76 01 125 76 03 125	644 644 644 644 644 644 644 645 655 655
00 19 24 14 14 19 19 25 14 14 19 19 26 16 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16	148 148 147 147 150 150 150 150 150 151 151 151 152 152 153 153 153 154 149 152 152 152	03 01 200 03 01 250 03 02 160 03 02 180 03 02 200 03 05 140 03 05 160 03 05 180 03 06 160 03 06 180 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 14 14 14 14 14 14 1	16 60 100 SB 16 65 125 SB 16 80 125 SB 16 80 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 05 160 20 01 125 22 01 140 22 01 125 22 01 140 22 01 160 22 01 125 22 01 140 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 05 160 22 06 160 22 07 160 23 01 140	27 27 27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30 30	30 36 160 31 11 160 31 15 160 31 21 160 32 11 135 32 21 135 32 23 135 32 31 135 33 01 160 34 12 130 34 12 130 34 12 130 34 22 130 34 22 130 34 32 130 34 32 130 35 11 115 35 12 115 35 21 115 35 22 115 ESD 35 31 115 35 32 115	35 34 34 34 34 36 36 36 36 36 37 37 37 37 37 37 37 38 38 38 39	44 20 J51 44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 21 J41 44 23 J11 44 23 J21 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 48 47 47 49 49 49 49	50 01 300 51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 12 115 64 12 115 64 22 115 64 32 120 64 32 120 64 42 115 64 52 115 64 52 115 64 52 115 64 52 115	52 52 53 53 53 53 57 57 58 58 58 58 59 58 58 59 58	74 05 200 74 05 250 74 06 160 74 06 180 74 06 250 74 07 250 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 76 01 125 76 03 125	644 644 644 644 644 644 645 646 646 646
00 19 25	148 147 147 150 150 150 150 150 150 151 151 151 151	03 01 250 03 02 160 03 02 180 03 02 200 03 05 140 03 05 160 03 05 180 03 05 200 03 06 160 03 06 180 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 17 160 11 192 140	14 14 14 14 14 14 14 14 14 14 14 14 17 17 17 17 17	16 65 125 SB 16 80 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 02 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 05 160 22 06 160 22 07 160 23 01 140	27 27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30	31 11 160 31 15 160 31 21 160 32 21 135 32 21 135 32 23 135 32 31 135 33 01 160 33 03 160 34 12 130 ESD 34 22 130 34 22 130 34 22 130 35 11 115 35 12 115 35 22 115 35 22 115 35 22 115 35 32 115 35 33 115	34 34 34 34 36 36 36 36 37 37 37 37 37 37 37 38 38 38 39	44 20 J61 44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 21 J41 44 23 J11 44 23 J21 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 48 47 47 49 49 49 49	51 01 210 55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 12 115 64 12 115 64 12 115 64 32 120 64 32 120 64 42 115 64 42 115 64 52 115 64 52 115 64 62 120	52 53 53 53 53 53 57 57 57 58 58 58 58 59 58 58 59 58	74 05 250 74 06 160 74 06 180 74 06 200 74 06 250 74 07 200 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 76 01 125 76 03 125	644 644 644 644 644 644 645 646 646 646
00 19 28	147 147 150 150 150 150 150 150 151 151 151 151	03 02 160 03 02 180 03 02 200 03 05 140 03 05 160 03 05 180 03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 17 160 11 17 160 11 192 140	14 14 14 14 14 14 14 14 14 14 14 14 15 15 17 17 17 17 17	16 80 125 SB 16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 140 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 02 160 22 01 160 22 01 160 22 01 160 22 01 160 22 02 160 22 05 160 22 05 160 22 06 160 22 07 160 23 01 140	27 27 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30	31 15 160 31 21 160 31 25 160 32 11 135 32 21 135 32 23 135 32 31 135 33 01 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 34 22 130 35 11 115 35 12 115 35 12 115 35 22 115 35 22 115 35 32 115 35 33 115	34 34 34 36 36 36 36 37 37 37 37 37 37 37 38 38 38 39	44 21 J01 44 21 J11 44 21 J21 44 21 J31 44 23 J11 44 23 J11 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 48 47 47 49 49 49 49	55 00 300 56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 12 115 64 12 115 64 12 115 64 32 120 64 32 120 64 32 120 64 32 120 64 42 115 64 52 115 64 52 115 64 62 120	53 53 53 53 53 57 57 57 58 58 58 58 59 58 58 59 58	74 06 160 74 06 180 74 06 200 74 06 250 74 07 200 74 07 250 74 12 160 74 12 180 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 76 01 125 76 03 125	64 64 64 64 64 65 65 65 65 65 65
00 19 29 14 19 19 19 19 30 19 30 21 15 19 30 31 15 19 30 66 19 30 66 19 30 66 19 30 67 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 19	147 150 150 150 150 150 150 150 150 150 150	03 02 180 03 02 200 03 05 140 03 05 160 03 05 180 03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 192 140	14 14 14 14 14 14 14 14 14 14 14 15 15 17 17 17 17 17	16 85 125 SB 19 01 130 19 03 130 20 01 125 20 01 140 20 01 180 20 01 200 20 02 140 20 02 160 20 05 140 20 05 160 20 01 125 22 01 140 22 01 160 22 01 180 22 01 160 22 01 160 22 01 160 22 01 160 22 01 160 22 02 160 22 05 160 22 05 160 22 07 160 23 01 140	27 29 29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30	31 21 160 31 25 160 32 11 135 32 21 135 32 23 135 32 31 135 33 01 160 33 03 160 34 12 130 34 12 130 34 22 130 34 22 130 34 32 130 34 32 130 ESD 35 11 115 35 12 115 ESD 35 21 115 35 22 115 35 32 115	34 34 36 36 36 36 36 37 37 37 37 37 37 38 38 39 38	44 21 J11 44 21 J21 44 21 J31 44 21 J41 44 23 J11 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 48 47 47 49 49 49 49	56 00 325 57 00 360 58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 12 115 64 12 115 64 22 115 64 32 120 64 32 120 ESE 64 42 115 64 52 115 64 52 115 64 62 120	53 53 53 53 57 57 58 58 58 58 59 58 58 59 58 59 58	74 06 180 74 06 200 74 06 250 74 07 200 74 07 250 74 12 160 74 12 180 74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 64 64 64 64 64 63 65 65 65 65
00 19 30 2 15 00 19 30 3 15 00 19 30 6 15 00 19 30 6 15 00 19 30 7 15 00 19 30 VIT 15 00 19 30 VIT 2 15 00 19 31 15 00 19 32 15 00 19 32 15 00 19 33 15 00 19 33 2 15 00 19 34 1 15 00 19 34 2 15 00 19 34 1 15 00 19 34 1 15 00 19 34 2 15 00 19 34 1 15 00 19 34 1 15 00 19 35 2 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 35 3 15 00 19 36 15 00 19 37 15 00 19 38 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 10 15 00 20 11 15 00 20 11 15 00 20 16 P 15 00 20 16 P 15 00 20 17 15 00 20 18 ESD 15 00 20 10 TL 15 00 20 11 TL 15 00 21 10 TL 15	150 150 150 150 150 150 150 151 151 151	03 05 140 03 05 160 03 05 180 03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 12 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 14 14 14 15 15 17 17 17 17 17	19 03 130 20 01 125 20 01 140 20 01 160 20 01 180 20 02 140 20 02 160 20 05 160 20 05 160 20 06 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 160 22 05 160 22 05 160 22 05 160 22 06 160 22 07 160 23 01 140	29 29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	32 11 135 32 21 135 32 23 135 32 31 135 33 01 160 33 03 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 31 115 35 32 115	36 36 36 36 36 37 37 37 37 37 37 38 38 38 39	44 21 J31 44 21 J41 44 23 J11 44 23 J21 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 48 47 47 49 49 49 49	58 10 225 58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 11 115 64 12 115 64 12 115 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	53 53 57 57 58 58 58 58 59 58 59 58 58 59 58 58 59	74 06 250 74 07 200 74 07 250 74 12 160 74 12 180 74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 64 64 64 63 65 65 65 65
00 19 30 21 15 15 10 19 30 3 15 10 19 30 66 15 10 19 30 66 15 15 10 19 30 VIT 15 10 19 30 VIT 16 10 19 30 VIT 17 10 19 31 15 10 19 32 15 10 19 34 17 15 10 19 34 17 15 10 19 34 17 15 10 19 34 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 10 19 35 17 15 15 15 15 15 15 15 15 15 15 15 15 15	150 150 150 150 150 151 151 151 151 152 153 153 153 149 149 152 152 152 152	03 05 160 03 05 180 03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 12 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 14 14 12 15 15 17 17 17 17 17	20 01 125 20 01 140 20 01 160 20 01 180 20 01 200 20 02 140 20 02 160 20 05 160 20 05 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 05 160 22 07 160 22 07 160 23 01 140	29 29 29 29 29 29 29 29 29 30 30 30 30 30 30 30	32 21 135 32 23 135 32 31 135 33 01 160 33 03 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 31 115 35 32 115	36 36 36 36 37 37 37 37 37 37 37 37 38 38 39 38	44 21 J41 44 23 J11 44 23 J21 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 48 47 47 47 49 49 49 49	58 30 225 61 01 200 62 12 120 64 01 115 64 02 115 64 11 115 64 12 115 64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	53 57 57 58 58 58 58 59 58 59 58 59 58 59 58	74 07 200 74 07 250 74 12 160 74 12 180 74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 76 01 125 76 03 125	64 64 64 64 64 63 65 65 65 65
00 19 30 3 15 10 19 30 6 15 10 19 30 6 15 10 19 30 7 15 10 19 30 VIT 1 15 10 19 30 VIT 2 15 10 19 31 15 10 19 34 2 15 10 19 34 2 15 10 19 34 2 15 10 19 34 3 14 10 19 34 2 15 10 19 34 3 15 10 19 35 1 15 10 19 30 15 10 19 30 15 10 15 10 10 10 10 10 10 10 10 10 10 10 10 10	150 150 150 150 151 151 151 151 152 153 153 153 153 149 149 152 152 152 152	03 05 180 03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 12 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 14 12 15 15 17 17 17 17 17	20 01 140 20 01 160 20 01 180 20 01 200 20 02 140 20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	32 23 135 32 31 135 33 01 160 33 03 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 34 32 130 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 ESD 35 31 115 35 32 115	36 36 36 37 37 37 37 37 37 37 38 38 39 38	44 23 J11 44 23 J21 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 47 47 49 49 49 49 49	61 01 200 62 12 120 64 01 115 64 02 115 64 11 115 64 12 115 64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	57 57 58 58 58 58 59 58 59 58 59 58 59 58 58 59	74 07 250 74 12 160 74 12 180 74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 76 01 125 76 03 125	64 64 64 64 63 65 65 65 65 65
00 19 30 6 15 10 19 30 6 15 10 19 30 7 15 10 19 30 VIT 15 10 19 31 15 10 19 32 15 10 19 34 1 15 10 19 34 1 15 10 19 34 1 15 10 19 34 1 15 10 19 34 1 15 10 19 34 1 15 10 19 35 1 15 15 10 19 35 1 15 15 15 15 15 15 15 15 15 15 15 15	150 150 150 151 151 151 152 153 152 153 153 153 149 149 152 152 152	03 05 200 03 06 160 03 06 180 03 06 200 03 07 160 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 12 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 12 15 15 17 17 17 17 17	20 01 160 20 01 180 20 01 200 20 02 140 20 02 160 20 05 140 20 05 160 22 01 125 22 01 140 22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	29 29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	32 31 135 33 01 160 33 03 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 32 115 35 33 31 115	36 36 36 37 37 37 37 37 37 38 38 39 38	44 23 J21 44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 48 47 47 49 49 49 49 49	62 12 120 64 01 115 64 02 115 64 11 115 64 12 115 64 12 115 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	57 58 58 58 58 59 58 58 59 58 59 58 58 59	74 12 160 74 12 180 74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 64 64 63 65 65 65 65 65
00 19 30 66 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 30 7 15 19 31 15 15 19 31 15 15 19 31 15 15 19 31 15 15 19 31 15 15 15 19 31 15 15 19 31 15 15 19 31 15 15 15 15 15 15 15 15 15 15 15 15 15	150 150 151 151 151 152 153 152 153 153 153 149 149 152 152 152	03 06 160 03 06 180 03 06 200 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 14 12 15 15 17 17 17 17 17	20 01 180 20 01 200 20 02 140 20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	29 29 29 29 29 29 29 30 30 30 30 30 30 30 30	33 01 160 33 03 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 22 115 35 22 115 35 32 115 35 32 115	36 36 37 37 37 37 37 37 38 38 39 38 39	44 23 J31 44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 48 48 47 47 49 49 49 49 49 49	64 01 115 64 02 115 64 11 115 64 12 115 64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	58 58 58 58 59 58 58 59 58 58 58	74 12 180 74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 32 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 64 63 65 65 65 65 65
00 19 30 7 15 10 19 30 VIT 1 15 10 19 30 VIT 1 15 10 19 30 VIT 1 15 10 19 30 VIT 2 15 10 19 31 15 10 19 31 15 10 19 33 15 10 19 34 1 15 10 19 34 1 15 10 19 34 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 19 35 1 15 10 10 19 35 1 15 15 10 10 19 35 1 15 15 10 10 19 35 1 15 15 10 10 10 10 10 10 10 10 10 10 10 10 10	150 151 151 151 152 153 152 152 153 153 149 149 152 152 152	03 06 180 03 06 200 03 07 160 03 07 180 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 14 12 15 15 17 17 17 17 17 17	20 01 200 20 02 140 20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 07 160 23 01 140	29 29 29 29 29 29 30 30 30 30 30 30 30 30 30	33 03 160 34 12 130 34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 ESD 35 11 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 35 31 115 35 32 115	36 37 37 37 37 37 37 37 38 38 39 38 39	44 29 J51 44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A1 46 11 A1 46 11 A3 46 11 A4 46 11 G0	48 48 47 47 49 49 49 49 49 49	64 02 115 64 11 115 64 12 115 64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	58 58 58 59 58 58 59 58 58 58 58	74 21 160 74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 63 65 65 65 65 65
00 19 30 VIT 19 00 19 30 VIT 19 00 19 30 VIT 19 00 19 31 19 00 19 33 2 19 00 19 34 19 00 19 34 19 00 19 34 19 00 19 34 19 00 19 34 19 00 19 34 19 00 19 34 19 00 19 35 19 00 19 56 19 00 19 57 19 00 19 56 19 00 19 57 19 00 19 19 19 00 19 19 19 00 19 19 19 00 19 19 19 00 19 19 19 19 00 19 19 19 19 19 19 19 19 19 19 19 19 19	151 151 151 152 153 152 153 153 153 149 149 152 152 152	03 06 200 03 07 160 03 07 180 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 14 14 14 14 12 15 15 17 17 17 17 17 17	20 02 140 20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 160 22 05 160 22 05 160 22 07 160 23 01 140	29 29 29 29 29 30 30 30 30 30 30 30 30 30 30	34 12 130 34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 ESD 35 11 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 35 31 115 35 32 115	37 37 37 37 37 37 37 38 38 38 39 38	44 29 J61 45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	48 47 47 49 49 49 49 49 49	64 11 115 64 12 115 64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	58 58 59 58 58 59 58 58 58 58	74 21 200 74 22 200 74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 75 52 125 76 01 125 76 03 125	64 64 63 65 65 65 65 65 65
00 19 30 VIT1 19 00 19 30 VIT2 15 15 00 19 31 15 00 19 33 2 15 00 19 34 1 15 00 19 34 2 15 00 19 34 3 14 00 19 34 4 14 00 19 35 1 15 00 19 35 1 15 00 19 35 3 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 36 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 00 19 37 15 15 00 19 37 15 15 00 19 37 15 15 00 19 37 15 15 00 15 15 15 00 15 15 15 00 16 16 15 00 17 17 17 17 17 17 17 17 17 17 17 17 17	151 151 152 153 152 152 153 153 153 149 149 152 152 152	03 07 160 03 07 180 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 14 14 14 12 15 15 17 17 17 17 17 17	20 02 160 20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 140 22 05 160 22 05 160 22 07 160 23 01 140	29 29 29 29 30 30 30 30 30 30 30 30 30 30	34 12 130 ESD 34 22 130 34 22 130 ESD 34 32 130 34 32 130 ESD 35 11 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 35 31 115 35 32 115	37 37 37 37 37 38 38 38 39 38 38	45 10 170 45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	47 47 49 49 49 49 49 49	64 12 115 64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	58 59 58 58 59 58 58 58 58	74 22 200 74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 75 32 125 76 01 125 76 03 125	64 63 65 65 65 65 65 65
00 19 30 VIT2 15 00 19 31 15 00 19 32 15 00 19 33 2 15 00 19 33 2 15 00 19 34 1 15 00 19 34 1 15 00 19 34 2 15 00 19 34 2 15 00 19 34 3 14 00 19 35 1 15 00 19 35 1 15 00 19 35 3 15 00 19 35 3 15 00 19 36 15 00 19 36 15 00 19 37 15 00 19 38 15 00 19 38 15 00 19 38 15 00 19 38 15 00 19 38 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 16 15 00 20 16 15 00 20 16 15 00 20 16 15 00 20 17 15 00 20 18 ESD 15 00 20 10 TL 15 00 20 18 ESD 15 00 20 10 TL 15 00 21 01 TL 15 00 21 10 TL 15	151 152 153 152 152 153 153 153 149 149 152 152	03 07 180 03 07 200 03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 07 160 11 12 160 11 15 160 11 17 160 11 17 160 11 192 140	14 14 14 12 15 15 17 17 17 17 17 17	20 05 140 20 05 160 20 06 160 22 01 125 22 01 140 22 01 180 22 02 140 22 02 160 22 05 160 22 05 160 22 07 160 23 01 140	29 29 29 30 30 30 30 30 30 30 30 30 30	34 22 130 ESD 34 32 130 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 35 31 115 35 32 115	37 37 37 37 38 38 38 39 38 39	45 21 200 46 10 A5 46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	47 49 49 49 49 49 49	64 12 115 ESD 64 22 115 64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	59 58 58 59 58 58 58 58	74 91 250 75 02 125 75 12 125 75 22 125 75 32 125 75 52 125 76 01 125 76 03 125	63 65 65 65 65 65 65
00 19 32	153 152 152 153 153 153 149 149 152 152	03 07 250 08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 12 160 11 12 160 11 15 160 11 17 160 11 17 160 11 92 140	14 12 15 15 17 17 17 17 17 17 17 17	20 06 160 22 01 125 22 01 140 22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	29 30 30 30 30 30 30 30 30 30 30	34 32 130 34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 35 31 115 35 32 115	37 37 38 38 39 38 38 39	46 10 A6 46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	49 49 49 49 49	64 32 120 64 32 120 ESD 64 42 115 64 52 115 64 62 120	58 59 58 58 58 58	75 12 125 75 22 125 75 32 125 75 32 125 75 52 125 76 01 125 76 03 125	65 65 65 65 65
00 19 33	152 152 153 153 153 149 149 152 152	08 05 110 09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 192 140	12 15 15 17 17 17 17 17 17 17	22 01 125 22 01 140 22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30 30 30 30 30 30 30	34 32 130 ESD 35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 35 31 115 35 32 115	37 38 38 39 38 38 38 39	46 11 A0 46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	49 49 49 49 49	64 32 120 ESD 64 42 115 64 52 115 64 62 120	59 58 58 58 58 59	75 22 125 75 32 125 75 52 125 76 01 125 76 03 125	65 65 65 65 65
00 19 33 2 15 00 19 34 1 15 00 19 34 1 15 00 19 34 2 15 00 19 34 3 14 00 19 34 4 14 00 19 35 1 15 00 19 35 2 15 00 19 35 2 15 00 19 35 3 15 00 19 36 15 00 19 37 15 00 19 38 15 00 19 38 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 57 15 00 20 30 SB 15 00 20 45 B 15 00 20 10 15 00 20 11 15 00 20 16 P 15 00 20 16 P 15 00 20 17 15 00 20 18 15	152 153 153 153 149 149 152 152	09 01 240 09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 192 140	15 15 17 17 17 17 17 17 17	22 01 140 22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30 30 30 30 30 30	35 11 115 35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 ESD 35 31 115 35 32 115	38 38 39 38 38 38	46 11 A1 46 11 A2 46 11 A3 46 11 A4 46 11 G0	49 49 49 49	64 42 115 64 52 115 64 62 120	58 58 58 58	75 32 125 75 52 125 76 01 125 76 03 125	65 65 65 65
00 19 34 1 15 15 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	153 153 153 149 149 152 152	09 02 240 11 01 160 11 02 160 11 05 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 192 140	15 17 17 17 17 17 17 17	22 01 160 22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30 30 30 30 30	35 12 115 35 12 115 ESD 35 21 115 35 22 115 35 22 115 ESD 35 31 115 35 32 115	38 39 38 38 39	46 11 A2 46 11 A3 46 11 A4 46 11 G0	49 49 49	64 52 115 64 62 120	58 58 59	75 52 125 76 01 125 76 03 125	65 65 65
00 19 34 1 15 00 19 34 2 15 00 19 34 3 14 00 19 34 4 14 00 19 35 1 15 00 19 35 2 15 00 19 35 3 15 00 19 36 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 16 P 15 00 20 16 P 15 00 20 17 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15	153 153 149 149 152 152 152	11 01 160 11 02 160 11 05 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 92 140	17 17 17 17 17 17 17	22 01 180 22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30 30 30 30	35 12 115 ESD 35 21 115 35 22 115 35 22 115 ESD 35 31 115 35 32 115	39 38 38 39	46 11 A3 46 11 A4 46 11 G0	49 49	64 62 120	58 59	76 01 125 76 03 125	65 65
00 19 34 2 15 00 19 34 3 14 00 19 34 4 14 00 19 35 1 15 00 19 35 2 15 00 19 35 3 15 00 19 36 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 16 P 15 00 20 16 P 15 00 20 17 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15	153 149 149 152 152 152	11 02 160 11 05 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 92 140	17 17 17 17 17 17	22 02 140 22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30 30 30	35 21 115 35 22 115 35 22 115 ESD 35 31 115 35 32 115	38 38 39	46 11 A4 46 11 G0	49		59	76 03 125	65
00 19 34 3	149 149 152 152 152	11 05 160 11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 92 140	17 17 17 17 17 17	22 02 160 22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30 30	35 22 115 35 22 115 ESD 35 31 115 35 32 115	38 39	46 11 G0		0+ 02 120 LJL			
00 19 34 4 14 00 19 35 1 15 00 19 35 2 15 00 19 35 3 15 00 19 36 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 11 15 00 20 12 15 00 20 16 15 00 20 16 P 15 00 20 17 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 21 01 TL 15 00 21 02 LE 15	149 152 152 152	11 06 160 11 07 160 11 12 160 11 15 160 11 17 160 11 92 140	17 17 17 17 17	22 05 140 22 05 160 22 06 160 22 07 160 23 01 140	30 30 30	35 22 115 ESD 35 31 115 35 32 115	39			64 72 120		76 05 125	65
00 19 35 2 15 00 19 35 3 15 00 19 36 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 12 15 00 20 15 15 00 20 16 P 15 00 20 17 15 00 20 18 15 00 21 01 TL 15 00 21 02 LE 15	152 152	11 12 160 11 15 160 11 17 160 11 92 140	17 17 17	22 05 160 22 06 160 22 07 160 23 01 140	30	35 31 115 35 32 115		46 11 G1	47	67 01 140	59	76 12 125	65
00 19 35 3	152	11 15 160 11 17 160 11 92 140	17 17	22 07 160 23 01 140				46 11 G2	47	67 01 160	59	76 22 125	65
00 19 36 15 00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 15 15 00 20 16 15 00 20 16 P 15 00 20 17 15 00 20 17 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 18 15 00 20 10 TL 15 00 21 01 TL 15 00 21 02 LE 15		11 17 160 11 92 140	17	23 01 140	30	0 = 0 0 11 = = 0 =	38	46 11 G3	47	67 01 200	59	76 81 125	65
00 19 39 15 00 19 41 15 00 19 48 15 00 19 56 15 00 19 57 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 15 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 17 15 00 20 18 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	152	11 92 140				35 32 115 ESD	39	46 11 G4	47	67 05 140	59	77 01 115	66
00 19 41 15 15 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18			18		30	35 42 115	38	46 13 A0	49	67 05 160	59	77 01 130	66
00 19 48 15 15 00 19 56 15 15 00 20 03 SB 15 00 20 04 SB 15 00 20 11 15 00 20 15 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 18 ESD 15 00 20 10 TL 15 00 20 18 ESD 15 00 20 10 TL 15 00 20 10 TL 15 00 20 10 TL 15 00 21 01 TL 15 00 21 02 LE 15	152	12 11 180	4.0	25 01 125	31	35 42 115 ESD		46 13 A1	49	67 05 200	59	77 02 115	66
00 19 56 15 15 15 16 17 18 15 18 18 18 18 18 18 18 18 18 18 18 18 18	154		18	25 01 140	31	35 52 145	38	46 13 A2	49	68 01 160	60	77 02 115 ESD	
00 19 57 15 15 00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 12 15 00 20 16 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 18 ESD 15 00 20 18 ESD 15 00 20 18 ESD 15 00 20 10 TL 15 00 21 01 TL 15 00 21 02 LE 15 00 21 02 LE 15	154 155	12 12 02 12 12 06	19 19	25 01 160 25 02 140	31 31	35 62 145 35 72 145	38 38	46 13 A3 46 19 A5	49 49	68 01 180 68 01 200	60 60	77 02 130 77 11 115	66 66
00 20 03 SB 15 00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 13 15 00 20 15 15 00 20 16 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 10 LE 15	155	12 12 10	19	25 02 160	31	35 82 145	38	46 19 A6	49	69 01 130	60	77 12 115	66
00 20 04 SB 15 00 20 10 15 00 20 11 15 00 20 12 15 00 20 13 15 00 20 15 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	155	12 12 11	19	25 03 125	31	36 12 130	41	46 20 A51	49	69 03 130	60	77 12 115 ESD	
00 20 11 15 15 00 20 12 15 15 00 20 13 15 15 00 20 16 P 15 15 00 20 16 P 15 00 20 17 15 00 20 18 ESD 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	156	12 19 02	19	25 03 160	31	36 22 125	41	46 20 A61	49	70 01 110	61	77 21 115	66
00 20 12 15 15 00 20 13 15 15 00 20 15 15 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 17 15 00 20 18 ESD 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	156	12 19 06	19	25 05 140	31	36 32 125	41	46 21 A01	49	70 01 125	61	77 21 130	66
00 20 13 15 15 00 20 15 15 00 20 16 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	156	12 19 10	19	25 05 160	31	36 42 125 SB	41	46 21 A11	49	70 01 140	61	77 22 115	66
00 20 15 15 15 00 20 16 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 17 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	156	12 19 11	19	25 06 160	31	37 11 125	42	46 21 A21	49	70 01 160	61	77 22 115 ESD	
00 20 16 15 00 20 16 P 15 00 20 16 P ESD 15 00 20 17 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	156	12 19 180 12 21 180	18	25 21 160	31	37 13 125	42	46 21 A31	49	70 01 180	61	77 22 130	66
00 20 16 P 15 00 20 16 P ESD 15 00 20 17 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	157	12 21 180	18 18	25 25 160 25 26 160	31 31	37 21 125 37 23 125	42 42	46 21 A41 46 23 A01	49 49	70 02 125 70 02 140	61 61	77 32 115 77 32 115 ESD	66 67
00 20 16 P ESD 15 00 20 17 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	157	12 40 200	20	26 11 200	32	37 31 125	42	46 23 A11	49	70 02 140	61	77 42 115	66
00 20 17 15 00 20 18 15 00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15		12 42 195	21	26 12 200	32	37 33 125	42	46 23 A21	49	70 02 180	61	77 42 115 ESD	
00 20 18 ESD 15 00 21 01 TL 15 00 21 02 LE 15	157	12 49 01	20	26 13 200	32	37 41 125	42	46 23 A31	49	70 04 140	61	77 42 130	66
00 21 01 TL 15 00 21 02 LE 15	157	12 49 02	20	26 15 200	32	37 43 125	42	46 29 A51	49	70 05 125	61	77 52 115	66
00 21 02 LE 15	157	12 49 03	20	26 16 200	32	38 11 200	43	46 29 A61	49	70 05 140	61	77 52 115 ESD	67
	158	12 49 21	21	26 17 200	32	38 15 200	43	48 11 J0	50	70 05 160	61	77 72 115	66
00 21 02 31 11	159	12 49 23	21	26 21 200	32	38 21 200	43	48 11 J1	50	70 05 180	61	77 72 115 ESD	
	159 162	12 50 200 12 59 01	20 20	26 22 200 26 23 200	32 32	38 25 200 38 31 200	43 43	48 11 J2 48 11 J3	50 50	70 06 125 70 06 140	61 61	78 03 125 78 03 125 ESD	68 69
	159	12 59 02	20	26 25 200	32	38 35 200	43	48 11 J4	50	70 06 140	61	78 13 125 78 13 125	68
	158	12 60 135	20	26 26 200	32	38 41 190	43	48 21 J01	50	70 06 180	61	78 13 125 ESD	
	160	12 62 180	21	26 27 200	32	38 45 190	43	48 21 J11	50	70 07 160	61	78 23 125	68
	160	12 69 135	20	27 01 160	33	38 71 200	43	48 21 J21	50	70 07 180	61	78 31 125	68
00 21 30 16	161	12 69 21	21	28 01 200	33	38 91 200	43	48 21 J31	50	70 11 110	61	78 41 125	68
	162	12 80 100 SB	22	28 03 200	33	38 95 200	43	48 21 J41	50	70 15 110	61	78 61 125	68
	162	12 82 130 SB	22	28 21 200	33	40 04 180	44	49 11 A0	51	70 26 160	61	78 61 125 ESD	
	100	12 85 100 SB	22	29 11 160	34	40 04 250	44	49 11 A1	51 E1	71 01 200	62	78 71 125	68
	163	13 01 160 13 01 614	23 23	29 21 160 29 25 160	34 34	41 04 180 41 04 250	44 44	49 11 A2 49 11 A3	51 51	71 02 200 71 11 200	62 62	78 71 125 ESD 78 81 125	69 68
	163	13 01 614	23	30 11 140	35	41 04 300	44	49 11 A3 49 11 A4	51	71 11 200	62	78 91 125	68
	163 12	13 72 160 SB	23	30 11 160	35	41 14 250	44	49 21 A01	51	72 01 140	63	79 02 120	70
	163 12 12	14 22 160	24	30 11 190	35	41 24 225	44	49 21 A11	51	72 01 160	63	79 02 120 ESD	
	163 12	14 26 160	24	30 13 140	35	41 34 165	44	49 21 A21	51	72 01 180	63	79 02 125	70
	163 12 12 13	45 44 400	24	30 13 160	35	42 14 280	45	49 21 A31	51	72 02 125	63	79 02 125 ESD	71
	163 12 12 13 13	15 11 120	24	30 15 140	35	42 24 280	45	49 21 A41	51	72 11 160	63	79 22 120	70
	163 12 12 13 13 13 13 13	15 19 005		30 15 160	35	42 34 280	45	49 31 A0	51	72 21 160	63	79 22 120 ESD	
	163 12 12 13 13 13 13 13 13	15 19 005 15 19 006	24	30 15 190	35 35	44 10 J5	48	49 41 A01	51	72 51 160	62	79 22 125	70
02 05 200 1 02 05 225 1	163 12 12 13 13 13 13 13	15 19 005	24 24 24	30 16 160		44 10 J6	48	50 00 130 50 00 160	52 52	74 01 140 74 01 160	64 64	79 22 125 ESD 79 32 125	71 70

Article-No.	Page	Article-No.	Page	Article-No.	Page	Article-No.	Page
79 32 125 ESI	71	90 29 01	83	95 16 200	97	97 52 09	109
79 42 125	70	90 29 02	83	95 17 200	97	97 52 10	109
79 42 125 ESI		90 29 15	83	95 17 500	98	97 52 13	109
79 52 125 79 52 125 ESI	70) 71	90 29 40 90 41 340	83 84	95 21 600 95 27 600	98 98	97 52 14 97 52 19	110 109
79 62 125 131	70	90 42 250	84	95 29 600	98	97 52 19	110
79 62 125 ESI		90 49 340	84	95 31 250	99	97 52 23	109
81 03 230	73	90 49 340 M	84	95 31 280	99	97 52 30	110
81 13 230	73	90 55 280	84	95 31 720	100	97 52 33	110
81 19 230	73	90 59 280	84	95 31 870	100	97 52 34	110
82 51 200 83 10 010	73 74	90 61 16 90 61 20	85 85	95 36 250 95 36 280	99 99	97 52 35 97 52 36	110 110
83 10 015	74	90 70 220	85	95 39 250	99	97 52 37	110
83 10 020	74	91 00 200	86	95 39 280	99	97 52 38	110
83 10 030	74	91 11 190	86	95 39 720	100	97 52 50	110
83 10 040	74	91 30 180	86	95 39 870	100	97 52 63	108
83 20 010	74	91 51 160	87	95 61 150	101	97 52 63 DG	108
83 20 015 83 20 020	74 74	91 61 160 91 71 160	87 87	95 61 190 95 71 445	100 101	97 52 64 97 52 65	108 108
83 30 005	74	92 02 53	89	95 71 600	101	97 52 65 DG	108
83 30 010	74	92 02 54	89	95 77 600	101	97 53 04	111
83 30 015	74	92 02 55	89	95 79 445	101	97 53 08	112
83 30 020	74	92 08 78 ESD	90	95 79 600	101	97 53 09	112
83 30 030	74	92 08 79 ESD	90	95 81 600	101	97 53 14	111
84 11 200 84 21 200	73 73	92 12 52 92 22 04	89 88	95 89 600 97 00 215 A	101 102	97 54 24 97 59 06	113 107
85 01 250	75	92 22 04	88	97 00 215 A	102	97 59 14	110
86 03 180	77	92 22 07	88	97 00 215 D	102	97 61 145 A	113
86 03 250	77	92 22 12	88	97 21 215	102	97 61 145 F	113
86 03 300	77	92 22 13	88	97 21 215 B	102	97 62 145 A	113
86 05 180	77	92 22 35	88	97 21 215 C	102	97 71 180	113
86 05 250 86 07 250	77 126	92 23 05 92 24 01	88 88	97 32 225 97 40 10	103 103	97 72 180 97 81 180	113 114
87 01 150	78	92 24 34	88	97 43 05	103	97 90 00	114
87 01 180	78	92 27 61	90	97 43 06	104	97 90 01	114
87 01 250	78	92 27 62	90	97 43 200	104	97 90 05	115
87 01 300	78	92 28 69 ESD	90	97 49 04	105	97 90 06	115
87 01 400	76	92 28 70 ESD	90	97 49 05	105	97 90 07	115
87 01 560 87 02 180	76 78	92 28 71 ESD 92 28 72 ESD	90	97 49 06 97 49 08	105 105	97 90 08 97 90 09	115 115
87 02 180	78	92 32 29	88	97 49 09	105	97 90 10	115
87 02 300	78	92 34 28	88	97 49 13	105	97 90 12	115
87 03 180	78	92 34 36	88	97 49 15	105	97 90 21	116
87 03 250	78	92 34 37	88	97 49 16	105	97 90 22	116
87 03 300	78 78	92 37 64 92 38 75 ESD	90 90	97 49 18 97 49 19	105	97 90 23	115 115
87 05 250 87 05 300	78	92 44 42	89	97 49 19	105 105	97 90 24 97 99 01	117
87 11 180	79	92 52 23	89	97 49 23	105	97 99 02	117
87 11 250	79	92 58 74 ESD	90	97 49 24	105	97 99 03	117
87 19 180	79	92 64 43	89	97 49 30	105	97 99 04	117
87 19 250	79	92 64 44	89	97 49 35	105	97 99 05	117
87 41 250 87 51 250	79 80	92 67 63 92 69 84	90 91	97 49 40 97 49 44	105 105	97 99 06 97 99 07	117 117
88 00 250	81	92 70 46	89	97 49 50	105	97 99 08	117
88 01 180	81	92 72 45	89	97 49 54	105	97 99 09	117
88 01 250	81	92 78 77 ESD	90	97 49 60	105	97 99 10	117
88 01 300	81	92 84 18	89	97 49 62	105	97 99 11	117
88 02 180	81	92 88 73 ESD 92 94 91	90	97 49 64	105	97 99 12	117
88 02 250 88 02 300	81 81	92 95 89	91 91	97 49 70 97 49 74	105 105	97 99 13 97 99 14	117 117
88 03 180	81	92 95 90	91	97 49 76	105	97 99 15	117
88 03 250	81	94 10 185	93	97 49 81	105	97 99 16	117
88 03 300	81	94 15 215	93	97 49 82	105	97 99 17	117
88 05 180	81	94 19 185	93	97 49 83	105	97 99 18	117
88 05 250 88 05 300	81 81	94 19 215 94 35 215	93 94	97 49 84 97 49 87	105 105	97 99 19 97 99 20	117 117
88 06 250	81	95 02 10	94	97 49 90	105	97 99 21	117
88 07 250	81	95 02 21	94	97 49 91	105	97 99 22	117
88 07 300	81	95 03 160 SB	95	97 49 93	105	97 99 23	117
89 01 200	82	95 05 140	95	97 49 94	105	97 99 24	117
89 01 250	82	95 05 165	96	97 49 95	105	97 99 25	117
89 03 200 89 03 250	82 82	95 05 185 95 05 190	95 95	97 50 01 97 51 04	106 106	97 99 26 97 99 27	117 117
89 04 250	82	95 06 230	96	97 51 10	100	97 99 28	117
89 05 200	82	95 11 165	96	97 51 12	107	97 99 29	117
89 05 250	82	95 11 200	97	97 52 03	109	97 99 30	117
90 01 125	82	95 11 500	98	97 52 04	109	97 99 31	117
90 03 125	82	95 12 165	96	97 52 05	109	97 99 32	117 117
90 25 20 90 25 40	83 83	95 12 200 95 16 165	97 96	97 52 06 97 52 08	109 109	97 99 33 97 99 34	117
55 25 15	00	00 10 100	00	0.0200	100	3, 00 04	

Article-No.

97 99 35

97 99 36

97 99 37

Page

117

117

117

Article-No.

98 03 055

98 03 06

98 03 07

Page

133

133

133

Article-No.

98 41

98 42

98 43

Page

135

137

137

All rights are reserved for alteration of models and technical alterations. Illustrations, dimensions and weights are only approximate.

All rights are reserved for mistakes and misprint. Printed in the Federal Republic of Germany KNIPEX-Werk 2007



CABLE JOINTS, CABLE TERMINATIONS, CABLE GLANDS, CABLE CLEATS FEEDER PILLARS, FUSE LINKS, ARC FLASH, CABLE ROLLERS, CUT-OUTS