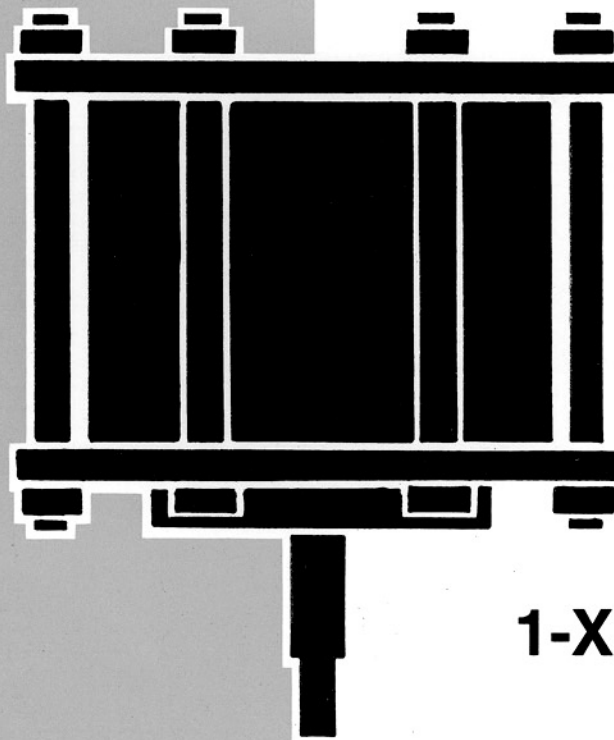


KOSO PARCOL



**1-X-400 SERIES
CYLINDER
PNEUMATIC
ACTUATORS**

1-X-400 SERIES CYLINDER PNEUMATIC ACTUATORS

Pneumatic cylinder actuators are well suited to those applications beyond the usual field of the pneumatic diaphragm type actuators: they can be feed with high air pressure to give high thrusts; they have about no limit in stroke, their thrust/travel characteristic is quite linear, their performance shall not be reduced for low temperature service and their ratio between overall dimensions (or weight) and thrust is very interesting.

In spite of such advantages, cylinders require accurate manufacturing and careful finishing which can bring up costs, together with the need for a positioner because of the high dead-band of piston not suited to a good throttling operation.

Cylinder actuators 1-X-400 series can be fitted on all types of globe, angle and butterfly valves manufactured by PARCOL.

Available models are the following:

Model	Main Features	Types
1-X-421	Double-action cylinder	100-160-200 300-450-600
1-X-431	Single-action cylinder Direct-acting (air to move stem down)	300-450-600
1-X-432	Single-action cylinder Reverse-acting (air to move stem up)	
1-X-442	Double-action cylinder with return spring Direct-acting (air to move stem down)	
1-X-442	Double-action cylinder with return spring Reverse-acting (air to move stem up)	

Single-action (S.A.) actuators consist of a spring-opposed piston actuated by air pressure. They offer the advantages of a simple fail-safe action (when air pressure fails, the compressed spring load overcomes the pressure load and moves the stem to open or to close the valve port according to required fail-safe action), and of a good stability when the load on the plug varies.

On the other hand in comparison with double-action (D.A.) actuators, they show lower net thrusts and overall dimensions growing more and more with the increase of supplied air pressure and required stroke.

Double-action actuators with return spring may offer a good compromise: the full thrust of the air pressure on one side of the piston, is balanced partly by a compressed spring and partly by the air pressure on the other side of the piston. So, to get a fail-safe action, there will be no need for complicate and little reliable pneumatic apparatus and, moreover, the net thrust of air pressure is only partly reduced by the spring thrust.

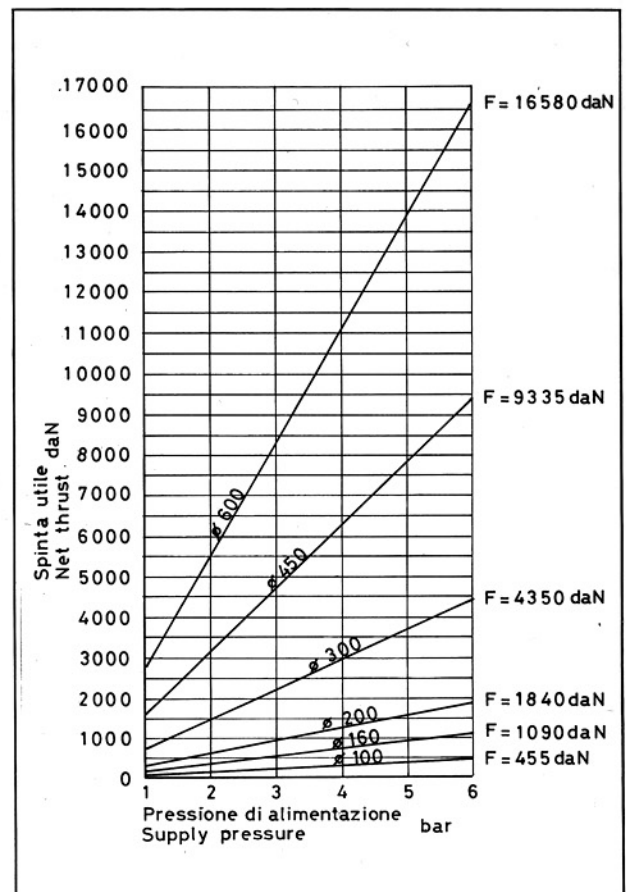
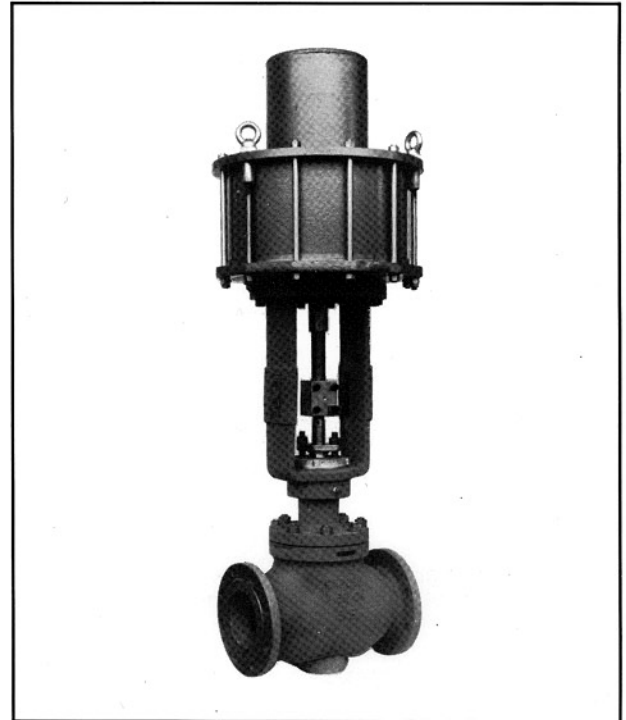
DESIGN DETAILS

PRESSURE/TEMPERATURE RATING

6 bar represent both the rated supply pressure of cylinder and the limit for tightness of sliding seals of piston. However all actuators are hydrostatically tested at 10 bar before delivery. Temperature limits for continuous service at 6 bar are given in the table of materials.

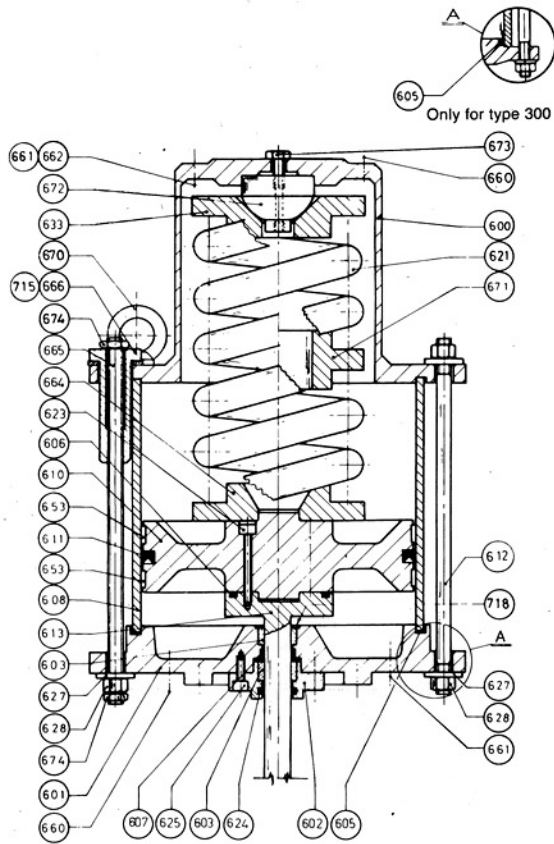
ACTUATOR BODY

Cylinder is worked from a precision steel tube. Inside surface is lapped, chrom-plated and polished.

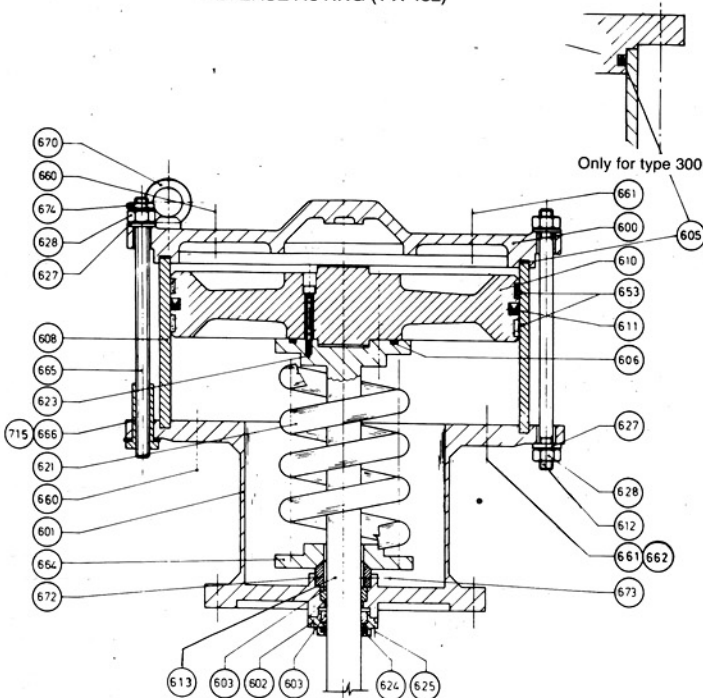




SINGLE ACTING CYLINDER ACTUATORS (1-X-430) TYPES 300 ÷ 600 PN 6



REVERSE ACTING (1-X-432)



DIRECT ACTING (1-X-431)

PART LIST

600	UPPER COVER
601	LOWER COVER
602	SEALING RING FLANGE
603	GUIDE BUSHING
605	SEALING RING
606	"O" RING
607	"H" RING
608	CYLINDER
610	PISTON
611	SEALING RING
612	BOLT
613	STEM
621	SPRING
623	SCREW
624	FELT RING
625	SCREW
627	WASHER
628	NUT
633	UPPER SPRING SEAT
653	PISTON SKID
660	PLUG
661	AIR CONNECTION
662	VENT PLUG
664	LOWER SPRING SEAT
665	SPECIAL BOLT
666	THREADED BUSH
670	EYEBOLT
671	INTERMEDIATE SPRING SEAT
672	PIVOT
673	GRUB SCREW (FOR DIRECT ACTION)
673	SCREW (FOR REVERSE ACTION)
674	NUT
715	WASHER
718	WASHER

Part reference can be used to order spare parts

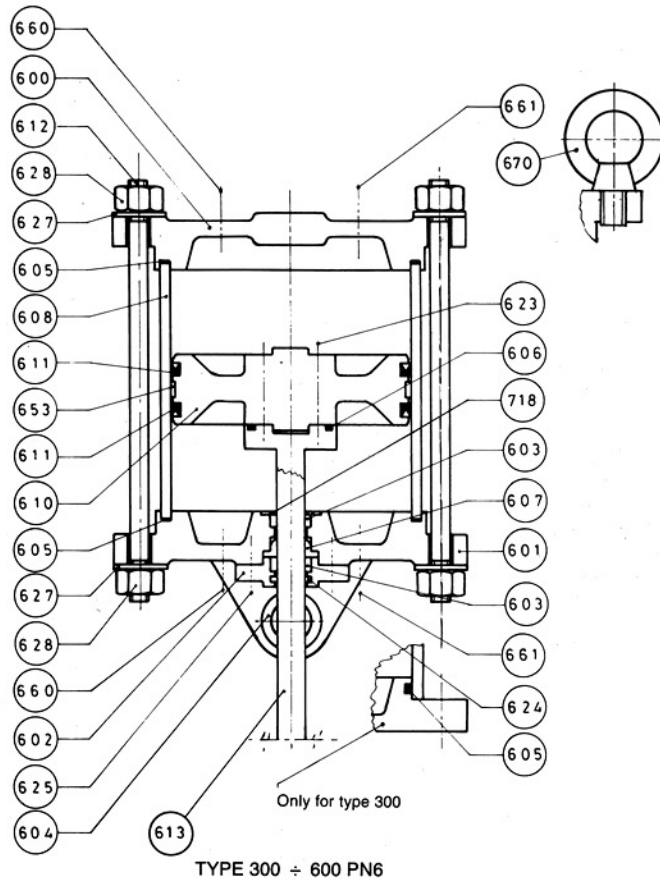
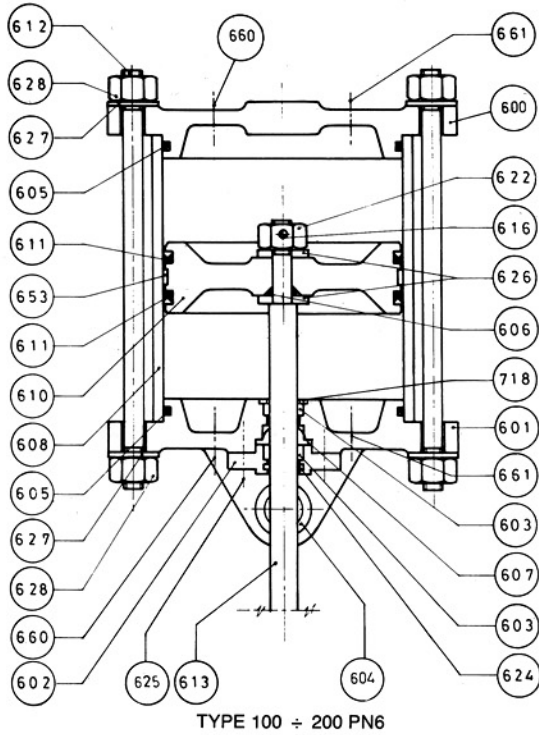
MAXIMUM LIFTABLE MASSES BY MEANS OF EYEBOLTS ITEM 670

SIZE	MASS (kg)
300	400
450	1000
600	1600

STANDARD SPRING RANGES (bar)

Reverse action	1,5 ÷ 3 / 2 ÷ 3,5 / 2,5 ÷ 4
Direct action	0,5 ÷ 2 / 1 ÷ 2,5

DOUBLE ACTING CYLINDER ACTUATORS (1-X-421)



PART LIST

600	UPPER COVER
601	LOWER COVER
602	SEALING RING FLANGE
603	GUIDE BUSHING
604	GUIDE BUSHING (*)
605	SEALING RING
606	"O" RING
607	"H" RING
608	CYLINDER
610	PISTON
611	SEALING RING
612	BOLT
613	STEM
616	ELASTIC PLIN
622	NUT
623	SCREW
624	FELT RING
625	SCREW
626	WASHER
627	WASHER
628	NUT
653	PISTON SKID
660	PLUG
661	AIR CONNECTION
670	EYEBOLT

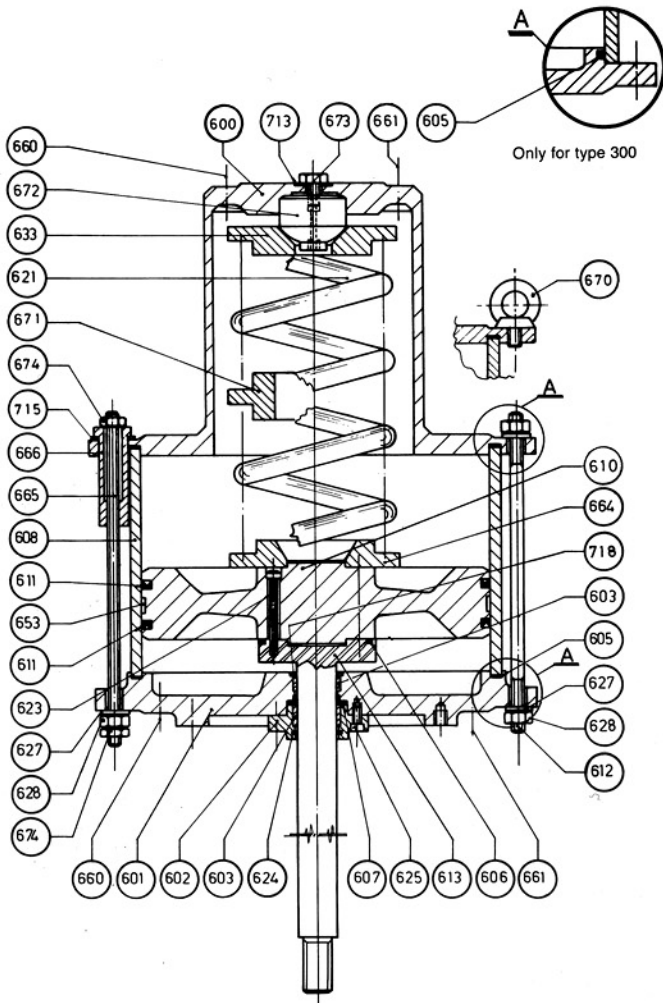
(*) Only for types suitable for pivoting

Part reference can be used to order spare parts

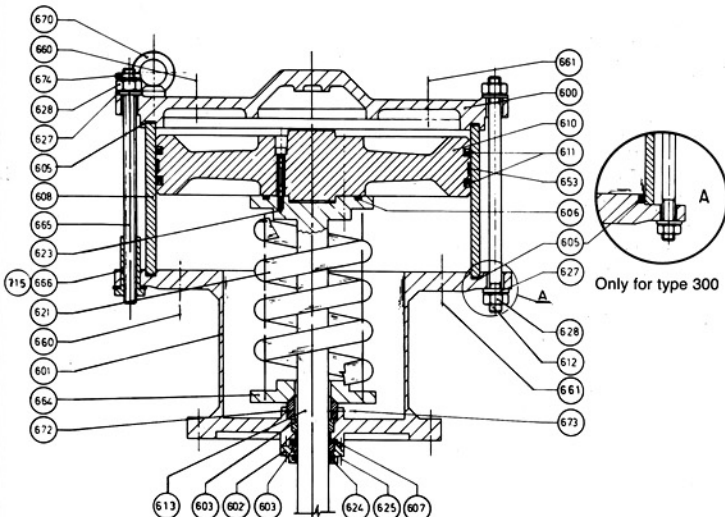
MAXIMUM LIFTABLE MASSES BY MEANS OF EYEBOLTS ITEM 670

SIZE	MASS (kg)
300	400
450	1000
600	1600

DOUBLE ACTING SPRING RETURN CYLINDER ACTUATORS TYPES 300 ÷ 600 PN 6



REVERSE ACTING (1-X-442)



DIRECT ACTING (1-X-441)

PART LIST

600	UPPER COVER
601	LOWER COVER
602	SEALING RING FLANGE
603	GUIDE BUSHING
605	SEALING RING
606	"O" RING
607	"H" RING
608	CYLINDER
610	PISTON
611	SEALING RING
612	BOLT
613	STEM
621	SPRING
623	SCREW
624	FELT RING
625	SCREW
627	WASHER
628	NUT
633	UPPER SPRING SEAT
653	PISTON SKID
660	PLUG
661	AIR CONNECTION
664	LOWER SPRING SEAT
665	SPECIAL BOLT
666	THREADED BUSH
670	EYEBOLT
671	INTERMEDIATE SPRING SEAT
672	PIVOT
673	GRUB SCREW (FOR DIRECT ACTION)
673	SCREW (FOR REVERSE ACTION)
674	NUT
713	GASKET
715	WASHER
718	WASHER

Part reference can be used to order spare parts

MAXIMUM LIFTABLE MASSES BY MEANS OF EYEBOLTS ITEM 670

SIZE	MASS (kg)
300	400
450	1000
600	1600

STANDARD SPRING RANGES (bar)

Reverse action	1,5 ÷ 3 / 2 ÷ 3,5 / 2,5 ÷ 4
Direct action	0,5 ÷ 2 / 1 ÷ 2,5

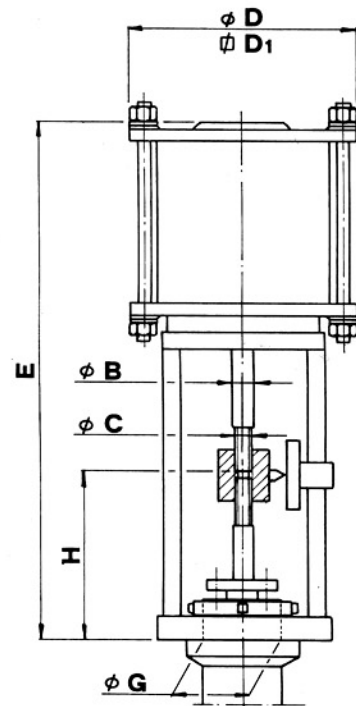
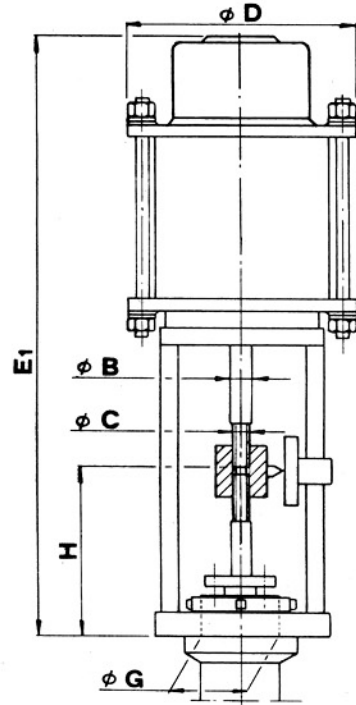
OVERALL DIMENSIONS (mm)

SINGLE ACTING ACTUATORS

Type	Cylinder stroke	Valve stroke	B	C	D	E ₁	G	H	Mass (kg)
300	100	≤ 76	34,92	M24x2	385	930	88	182	75
	100	77 ÷ 100	34,92	M24x2	385	1000	88	221	85
	150	101 ÷ 150	34,92	M24x2	385	1170	88	266	96
	200	151 ÷ 200	34,92	M24x2	385	1400	88	291	120
450	100	≤ 100	50,8	40 11 fil. 1"	565	1320	128	270	280
	150	101 ÷ 150	50,8	40 11 fil. 1"	565	1640	128	295	325
	200	151 ÷ 200	50,8	40 11 fil. 1"	565	1920	128	320	360
600	100	≤ 100	60	40 11 fil. 1"	730	1280	140	270	690
	150	101 ÷ 150	60	40 11 fil. 1"	730	1720	140	295	790
	200	151 ÷ 200	60	40 11 fil. 1"	730	1980	320	320	850

DOUBLE ACTING ACTUATORS

Type	Cylinder stroke	Valve stroke	B	C	D	D ₁	E	G	H	Mass (kg)
100	100	≤ 45	16	M16		116	496	76	138	15
160	100	≤ 60	19,05	M18x1,5		180	529	76	146	20
200	100	≤ 76	25,4	M24x2		216	599	88	182	25
	100	77 ÷ 100	25,4	M24x2		216	611	88	194	25
	150	101 ÷ 150	25,4	M24x2		216	711	88	219	28
	200	151 ÷ 200	25,4	M24x2		216	811	88	244	31
300	100	≤ 76	34,92	M24x2	380		765	88	182	50
	100	77 ÷ 100	34,92	M24x2	380		765	88	221	50
	150	101 ÷ 150	34,92	M24x2	380		885	88	266	57
	200	151 ÷ 200	34,92	M24x2	380		985	88	291	64
	250	201 ÷ 250	34,92	M24x2	380		1085	88	316	71
	300	251 ÷ 300	34,92	M24x2	380		1185	88	341	78
	350	301 ÷ 350	34,92	M24x2	380		1285	88	366	85
450	100	≤ 100	50,8	40 11 fil. 1"	560		924	128	270	220
	150	101 ÷ 150	50,8	40 11 fil. 1"	560		1024	128	295	230
	200	151 ÷ 200	50,8	40 11 fil. 1"	560		1124	128	320	240
	250	201 ÷ 250	50,8	40 11 fil. 1"	560		1224	128	345	250
	300	251 ÷ 300	50,8	40 11 fil. 1"	560		1324	128	370	260
	350	301 ÷ 350	50,8	40 11 fil. 1"	560		1424	128	395	270
	400	351 ÷ 400	50,8	40 11 fil. 1"	560		1524	128	420	280
	450	401 ÷ 450	50,8	40 11 fil. 1"	560		1624	128	445	290
600	100	≤ 100	60	40 11 fil. 1"	730		1005	140	270	590
	150	101 ÷ 150	60	40 11 fil. 1"	730		1105	140	295	605
	200	151 ÷ 200	60	40 11 fil. 1"	730		1205	140	320	620
	250	201 ÷ 250	60	40 11 fil. 1"	730		1305	140	345	630
	300	251 ÷ 300	60	40 11 fil. 1"	730		1405	140	370	645
	350	301 ÷ 350	60	40 11 fil. 1"	730		1505	140	395	655
	400	351 ÷ 400	60	40 11 fil. 1"	730		1605	140	420	670
	450	401 ÷ 450	60	40 11 fil. 1"	730		1705	140	445	685
	500	451 ÷ 500	60	40 11 fil. 1"	730		1805	140	470	695
	600	501 ÷ 600	60	40 11 fil. 1"	730		1905	140	520	720



KOSO PARCOL S.r.l. a socio unico

Sede legale: Via Isonzo, 2, 20010 Canegrate (Milano) ITALY

Partita IVA e Codice Fiscale 09684900963

Cap. Soc. €110.000,00 | R.E.A. MI – 2106767

Phone: +39 0331 413111 | Fax: +39 0331 404 215

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