

© 2012 G.B.Studio - www.gbstudio.it - Caserta

Rev. 06.12



CYLINDERS | **LIGHT DUTY**

Dettagli Tecnici • Technical Data • Détail Techniques • Technischedatum • Detalles Tècnicos

Dettagli Tecnici • Technical Data • Détail Techniques • Technischedatum • Detalles Tècnicos

H.S. Penta spa
via Proventa, 31
48018 Faenza RA - Italy
T +39 0546 664848
F +39 0546 664860
hspenta@hspenta.it
hspenta.it



Index



LIGHT DUTY

2 L 174

3 L 160

4 L 140

5 L 120

6 L 105

7 L 90

8 L 75

9 Notes

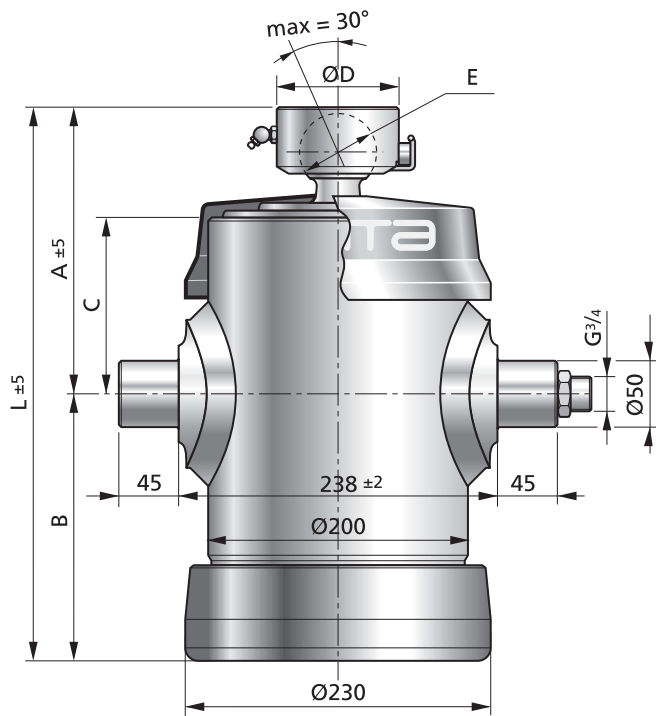
10-11 Selection charts

12 Assembly

Endpaper Warnings - Warranty

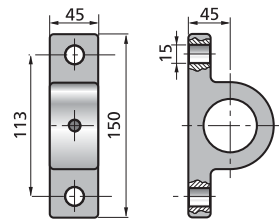
L 174

EFFECTIVE DIAMETER [mm] 174 • 154 • 135 • 120 • 105 • 90 • 75 • 60

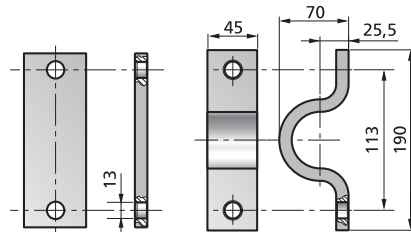


ACCESSORIES

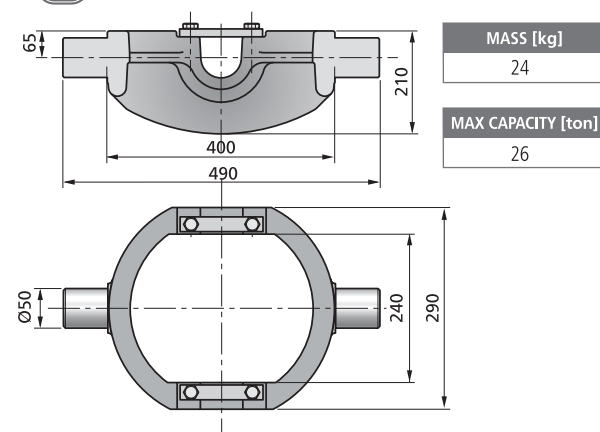
CYLINDER SUPPORT PAIR A70050001



CRADLE SUPPORT PAIR A60050001

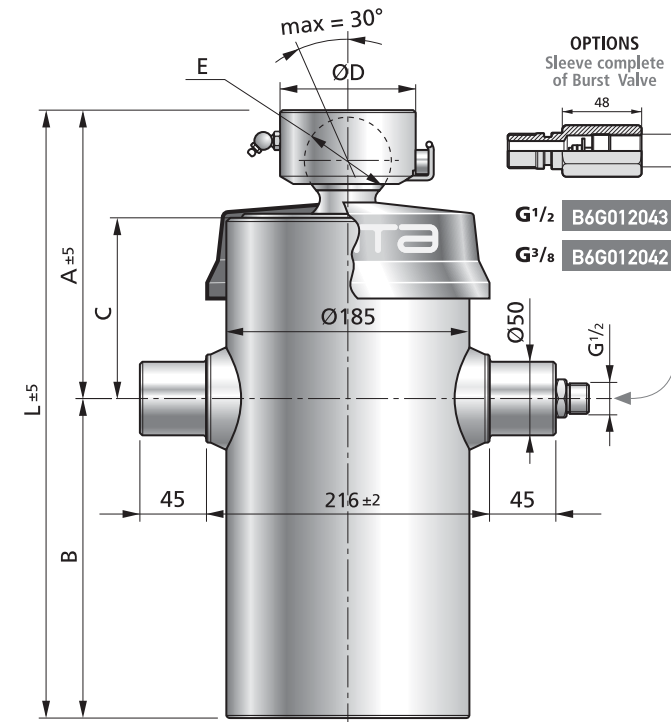


CRADLE A50200001

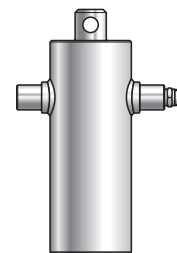


L 160

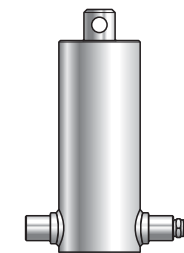
EFFECTIVE DIAMETER [mm] 160 • 140 • 120 • 105 • 90 • 75 • 60



OPTION with ROD EYE - PIN

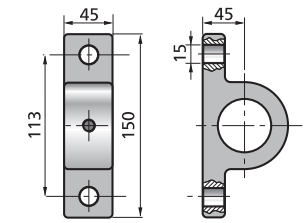


OPTION with ROD EYE - LOWER PIN

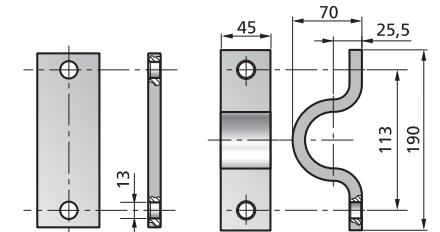


ACCESSORIES

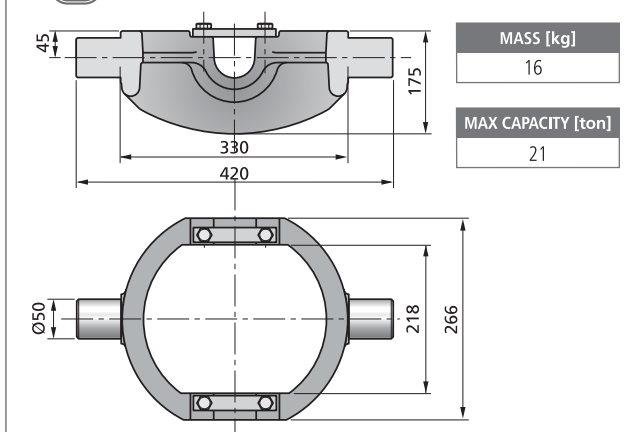
CYLINDER SUPPORT PAIR A70050001



CRADLE SUPPORT PAIR A60050001



CRADLE A50300001



L 174 TECHNICAL DATA

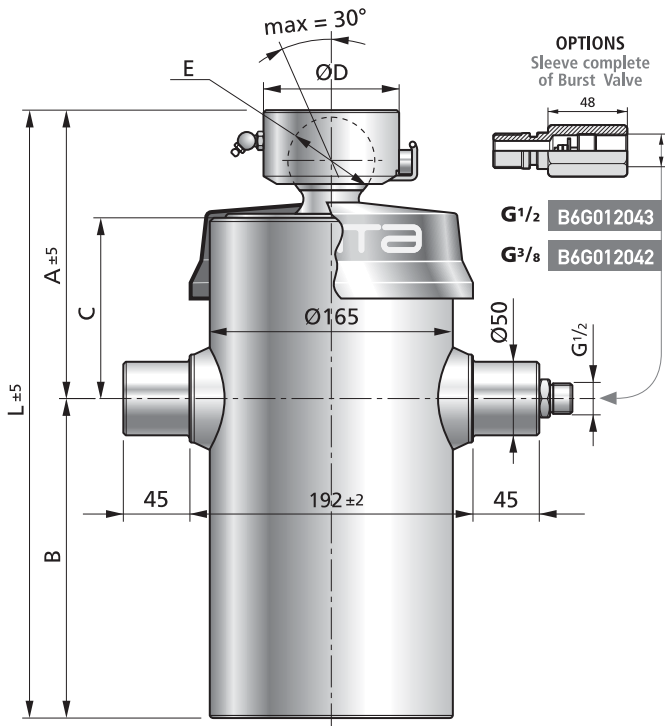
MODEL	CODE	EXTENSION N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm ³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	C	D	E
BL300 1796 174 8	3103001748001	8	1796	78	20,1	180	14-24	417	216	201	133	92	58
BL300 1569 174 7	3103001747001	7	1569	81	19,5	180	17-28	417	216	201	133	92	58
BL300 1345 174 6	3103001746001	6	1345	74	18,5	180	18-30	417	216	201	133	92	58

L 160 TECHNICAL DATA

MODEL	CODE	EXTENSION N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm ³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	C	D	E
BL400 2271 160 7	3104001607001	7	2271	76	22,6	180	12-21	517	246	271	174	92	58
BL400 1950 160 6	3104001606001	6	1950	77	21,7	180	15-25	517	246	271	174	92	58
BL400 1631 160 5	3104001605001	5	1631	68	20,2	180	17-29	517	246	271	174	92	58
BL400 1315 160 4	3104001604001	4	1315	65	18,2	180	17-29	517	246	271	174	92	58
BL300 1613 160 7	3103001607001	7	1613	61	16,1	180	12-21	423	219	204	147	92	58
BL300 1386 160 6	3103001606001	6	1386	61	15,4	180	15-25	423	219	204	147	92	58
BL300 1161 160 5	3103001605001	5	1161	55	14,4	180	17-29	423	219	204	147	92	58

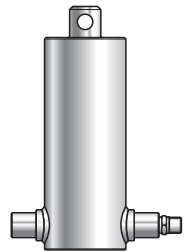
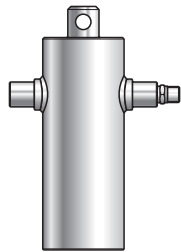
L 140

EFFECTIVE DIAMETER [mm] 140 • 120 • 105 • 90 • 75 • 60



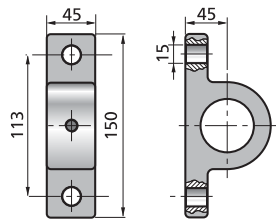
OPTION with ROD EYE - PIN

OPTION with ROD EYE - LOWER PIN

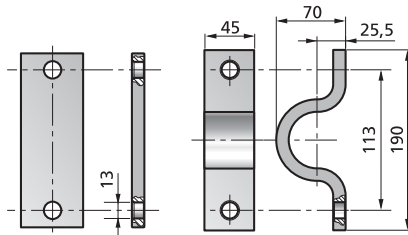


ACCESSORIES

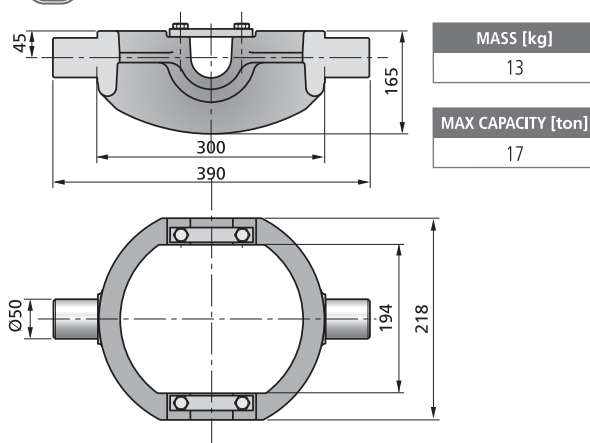
CYLINDER SUPPORT PAIR A70050001



CRADLE SUPPORT PAIR A60050001

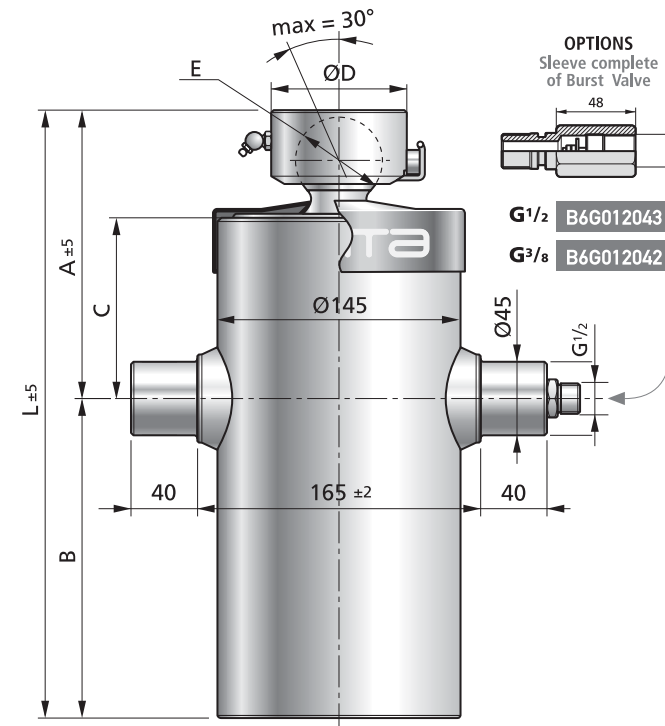


CRADLE A50400001



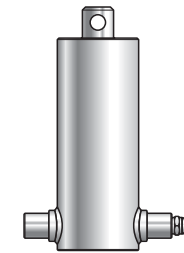
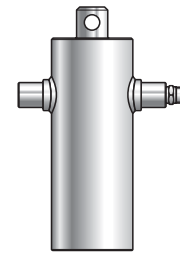
L 120

EFFECTIVE DIAMETER [mm] 120 • 105 • 90 • 75 • 60 • 45



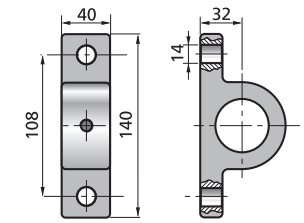
OPTION with ROD EYE - PIN

OPTION with ROD EYE - LOWER PIN

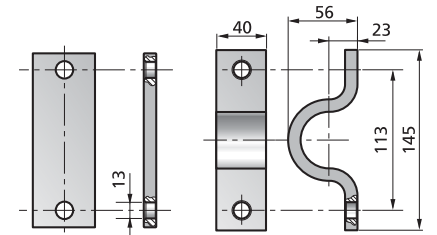


ACCESSORIES

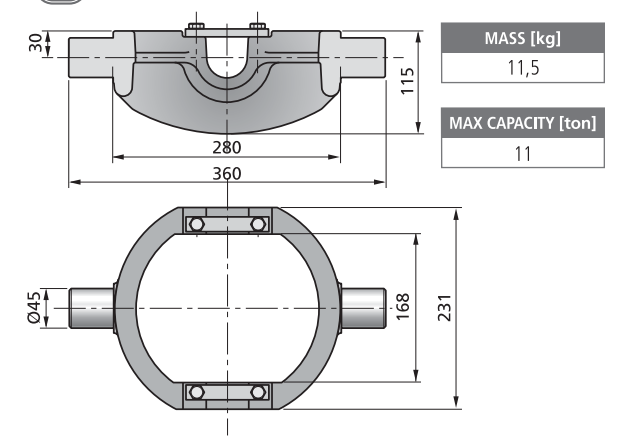
CYLINDER SUPPORT PAIR A70045001



CRADLE SUPPORT PAIR A60045001



CRADLE A5L080001



L 140 TECHNICAL DATA

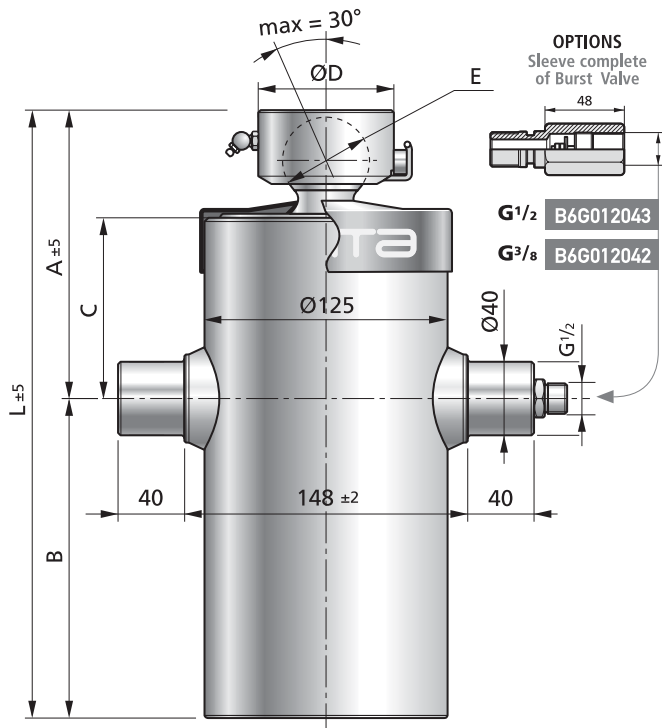
MODEL	CODE	EXTENSION N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	C	D	E
BL400 1947 140 6	3104001406001	6	1947	61	16	180	11-18	510	234	276	162	92	58
BL400 1625 140 5	3104001405001	5	1625	63	15,1	180	13-22	510	234	276	162	92	58
BL400 1307 140 4	3104001404001	4	1307	53	13,7	180	15-25	510	234	276	162	92	58
BL300 1383 140 6	3103001406001	6	1383	49	11,4	180	11-18	416	242	174	170	92	58
BL300 1155 140 5	3103001405001	5	1155	50	10,8	180	13-22	416	242	174	170	92	58
BL300 930 140 4	3103001404001	4	930	43	9,8	180	15-25	416	242	174	170	92	58
BL270 1197 140 6	3102701406001	6	1197	45	9,9	180	11-18	385	204	181	132	92	58
BL270 1000 140 5	3102701405001	5	1000	46	9,3	180	13-22	385	204	181	132	92	58
BL270 806 140 4	3102701404001	4	806	40	8,5	180	15-25	385	204	181	132	92	58

L 120 TECHNICAL DATA

MODEL	CODE	EXTENSION N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	C	D	E
BL445 2250 120 6	3104451206001	6	2250	50	13,2	200	7-14	541	143	398	88	74	43
BL445 1875 120 5	3104451205001	5	1875	55	12,6	200	9-17	558	160	398	88	92	58
BL445 1501 120 4	3104451204001	4	1501	55	11,6	200	11-21	558	160	398	88	92	58
BL410 2057 120 6	3104101206001	6	2057	47	12,1	200	7-14	508	215	293	160	74	43
BL410 1710 120 5	3104101205001	5	1710	50	11,5	200	9-17	525	232	293	160	92	58
BL410 1369 120 4	3104101204001	4	1369	51	10,6	200	11-21	525	232	293	160	92	58
BL370 896 120 3	3103701203001	3	896	38	7,9	200	13-24	480	197	283	125	92	58
BL360 1727 120 6	3103601206001	6	1727	42	10,2	200	7-14	453	180	273	125	74	43
BL360 1435 120 5	3103601205001	5	1435	44	9,7	200	9-17	470	197	273	125	92	58
BL360 1145 120 4	3103601204001	4	1145	46	8,8	200	11-21	470	197	273	125	92	58
BL305 1415 120 6	3103051206001	6	1415	36	8,3	200	7-14	401	180	221	125	74	43
BL305 1175 120 5	3103051205001	5	1175	39	7,9	200	9-17	418	197	221	125	92	58
BL275 1241 120 6	3102751206001	6	1241	37	7,3	200	7-14	372	180	192	125	74	43
BL275 1030 120 5	3102751205001	5	1030	35	7	200	9-17	389	197	192	125	92	58

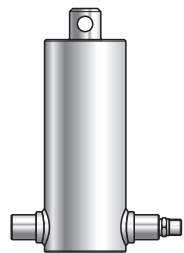
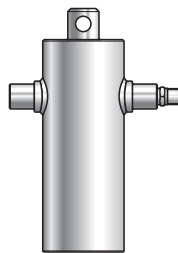
L 105

EFFECTIVE DIAMETER [mm] 105 • 90 • 75 • 60 • 45 • 30



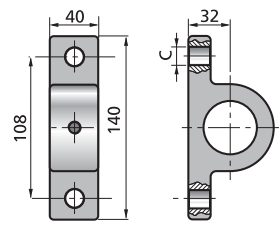
OPTION with ROD EYE - PIN

OPTION with ROD EYE - LOWER PIN

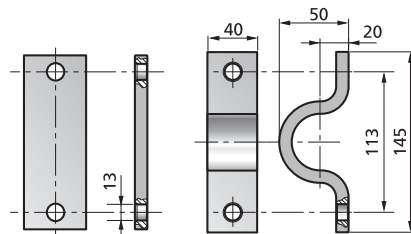


ACCESSORIES

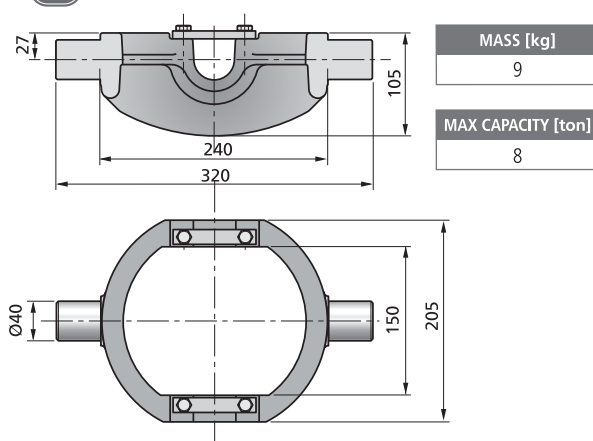
CYLINDER SUPPORT PAIR A70040001



CRADLE SUPPORT PAIR A60040001

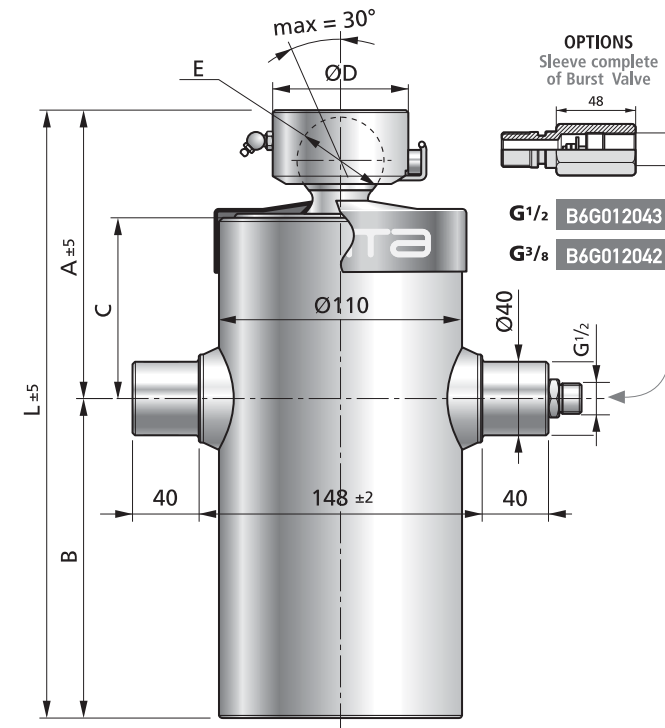


CRADLE A5L060001



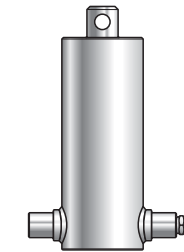
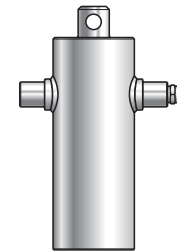
L 90

EFFECTIVE DIAMETER [mm] 90 • 75 • 60 • 45 • 30



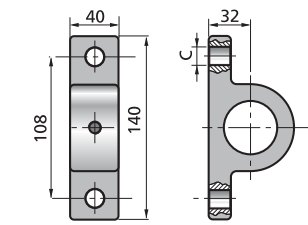
OPTION with ROD EYE - PIN

OPTION with ROD EYE - LOWER PIN

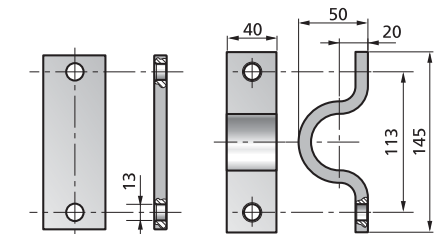


ACCESSORIES

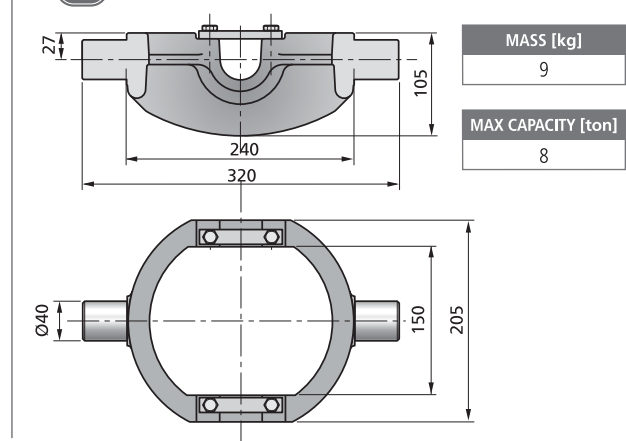
CYLINDER SUPPORT PAIR A70040001



CRADLE SUPPORT PAIR A60040001



CRADLE A5L060001



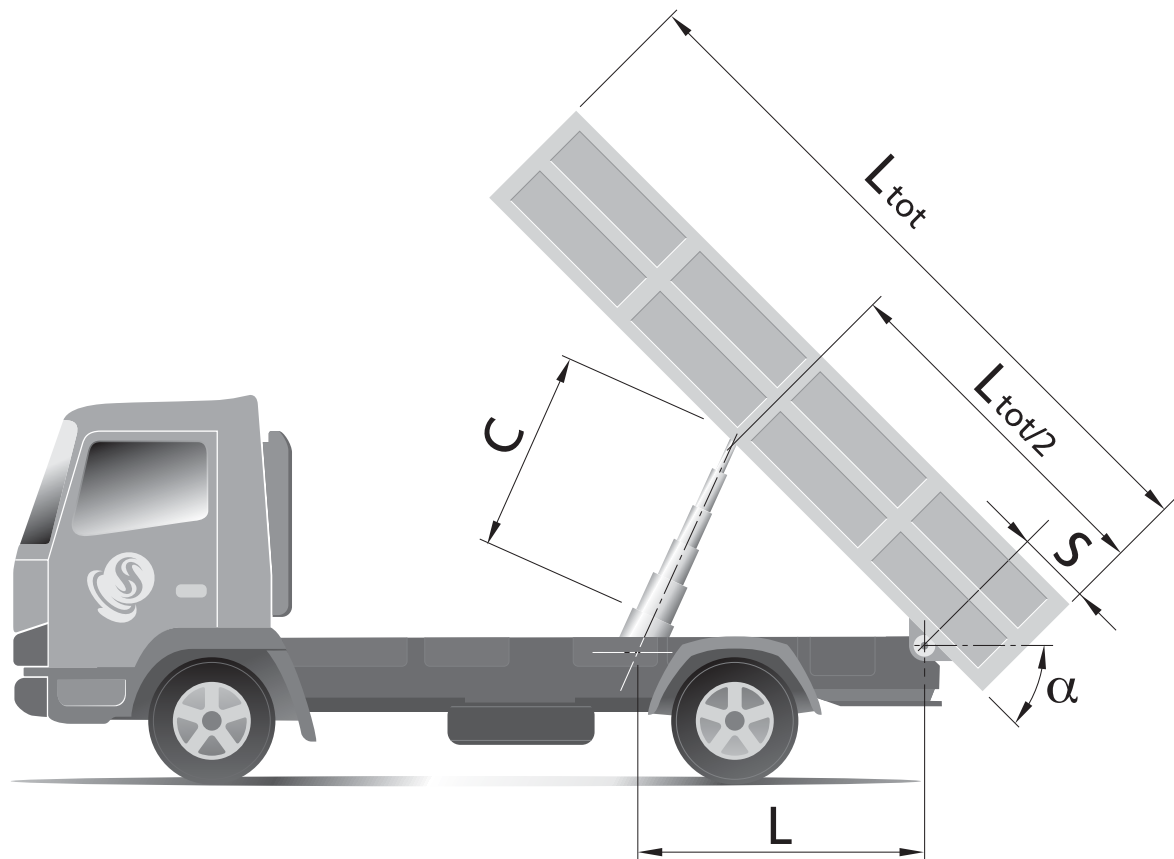
L 105 TECHNICAL DATA

MODEL	CODE	EXTENSION N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	C	D	E
BL445 1872 105 5	3104451055001	5	1872	38	8,9	200	6-12	532	140	392	85	74	43
BL445 1492 105 4	3104451054001	4	1492	40	8,3	200	8-15	549	157	392	85	92	58
BL360 1432 105 5	3103601055001	5	1432	30	6,8	200	6-12	444	150	294	95	74	43
BL360 1140 105 4	3103601054001	4	1140	33	6,4	200	8-15	461	167	294	95	92	58
BL360 855 105 3	3103601053010	3	855	35	5,6	200	10-18	461	167	294	95	92	58
BL320 1237 105 5	3103201055001	5	1237	28	5,9	200	6-12	405	150	255	95	74	43
BL320 984 105 4	3103201054001	4	984	27	5,5	200	8-15	405	150	255	95	74	43
BL320 984 105 4	3103201054003	4	984	29	5,4	200	8-15	422	167	255	95	92	58
BL275 1027 105 5	3102751055001	5	1027	24	4,9	200	6-12	363	150	213	95	74	43
BL275 816 105 4	3102751054001	4	816	22	4,6	200	8-15	363	150	213	95	74	43
BL265 1182 105 6	3102651056001	6	1172	22	4,7	200	5-9	351	151	200	95	74	43
BL235 1003 105 6	3102351056001	6	1004	21	4,1	200	5-9	323	151	172	95	74	43

L 90 TECHNICAL DATA

MODEL	CODE	EXTENSION N.	POWER STROKE [mm]	MASS [kg]	WORKING VOLUME [dm³]	MAX. WORKING PRESSURE [bar]	TIPPING CAPACITY [ton]	L	A	B	C	D	E
BL475 1211 90 3	3104750903001	3	1199	35	5,4	220	5-14	578	180	398	108	92	58
BL360 1140 90 4	3103600904001	4	1140	25	4,3	220	5-11	445	156	289	100	74	43
BL360 866 90 3	3103600903001	3	848	26	3,8	220	5-14	445	156	289	100	74	43
BL320 1256 90 5	3103200905001	5	1256	25	4	220	4-8	405	155	250	100	74	43
BL320 984 90 4	3103200904001	4	984	23	3,7	220	5-11	405	155	250	100	74	43
BL275 816 90 4	3102750904001	4	816	20	3,1	220	5-11	363	155	208	100	74	43
BL245 676 90 4	3102450904001	4	676	19	2,5	220	5-11	328	152	176	97	74	43

Selection charts



STROKE

L [mm]	BODY TILTING α [°]					
	40	45	48	50	55	60
500	342	383	407	423	462	500
750	513	574	610	634	693	750
1000	684	765	813	845	923	1000
1100	752	842	895	930	1016	1100
1200	821	918	976	1014	1108	1200
1300	889	995	1058	1099	1201	1300
1400	958	1072	1139	1183	1293	1400
1500	1026	1148	1220	1268	1385	1500
1600	1094	1225	1302	1352	1478	1600
1700	1163	1301	1383	1437	1570	1700
1800	1231	1378	1464	1521	1662	1800
1900	1300	1454	1546	1606	1755	1900
2000	1368	1531	1627	1690	1847	2000
2150	1471	1646	1749	1817	1986	2150
2300	1573	1760	1871	1944	2124	2300
2450	1676	1875	1993	2071	2263	2450
2600	1779	1990	2115	2198	2401	2600
2750	1881	2105	2237	2324	2540	2750
3000	2052	2296	2440	2536	2770	3000
3200	2189	2449	2603	2705	2955	3200

C POWER STROKE
[mm]

$$C_{(mm)} = 2L_{(mm)} \sin\left(\frac{\alpha_{(rad)}}{2}\right) \Rightarrow$$

$$\Rightarrow C_{(mm)} \approx \frac{3,1416}{180} \cdot \alpha_{(°)} \cdot L_{(mm)} \cdot \left(1 - \frac{9,8696}{777600} \alpha_{(°)}^2\right)$$

• The stroke is identified by crossing the pivot length (L) with the requested tipping angle (°).

THRUST

EXTENSION Ø [mm]	PRESSIONE PRESSURE [bar]									THRUST [kN]
	50	75	100	125	150	175	200	220	240	
30	4	5	7	9	11	12	14	16	17	
45	8	12	16	20	24	28	32	35	38	
60	14	21	28	35	42	49	57	62	68	
75	22	33	44	55	66	77	88	97	106	
90	32	48	64	80	95	111	127	140	153	
105	43	65	87	108	130	152	173	190	208	
120	57	85	113	141	170	198	226	249	271	
135	72	107	143	179	215	250	286	315	343	
140	77	115	154	192	231	269	308	338	369	
154	15	140	186	233	279	326	372	410	447	
160	100	151	201	251	301	352	402	442	482	
174	119	178	238	297	356	416	475	523	570	

$$S_{(kN)} = \frac{\pi}{4} d_{(mm)}^2 \frac{p_{(bar)}}{10000} \Rightarrow$$

$$\Rightarrow S_{(kN)} \approx \frac{0,785}{10000} d_{(mm)}^2 p_{(bar)}$$

• The thrust is a force generated by oil under pressure, which lifts the stage of the cylinder. "D" is the diameter of the stage.

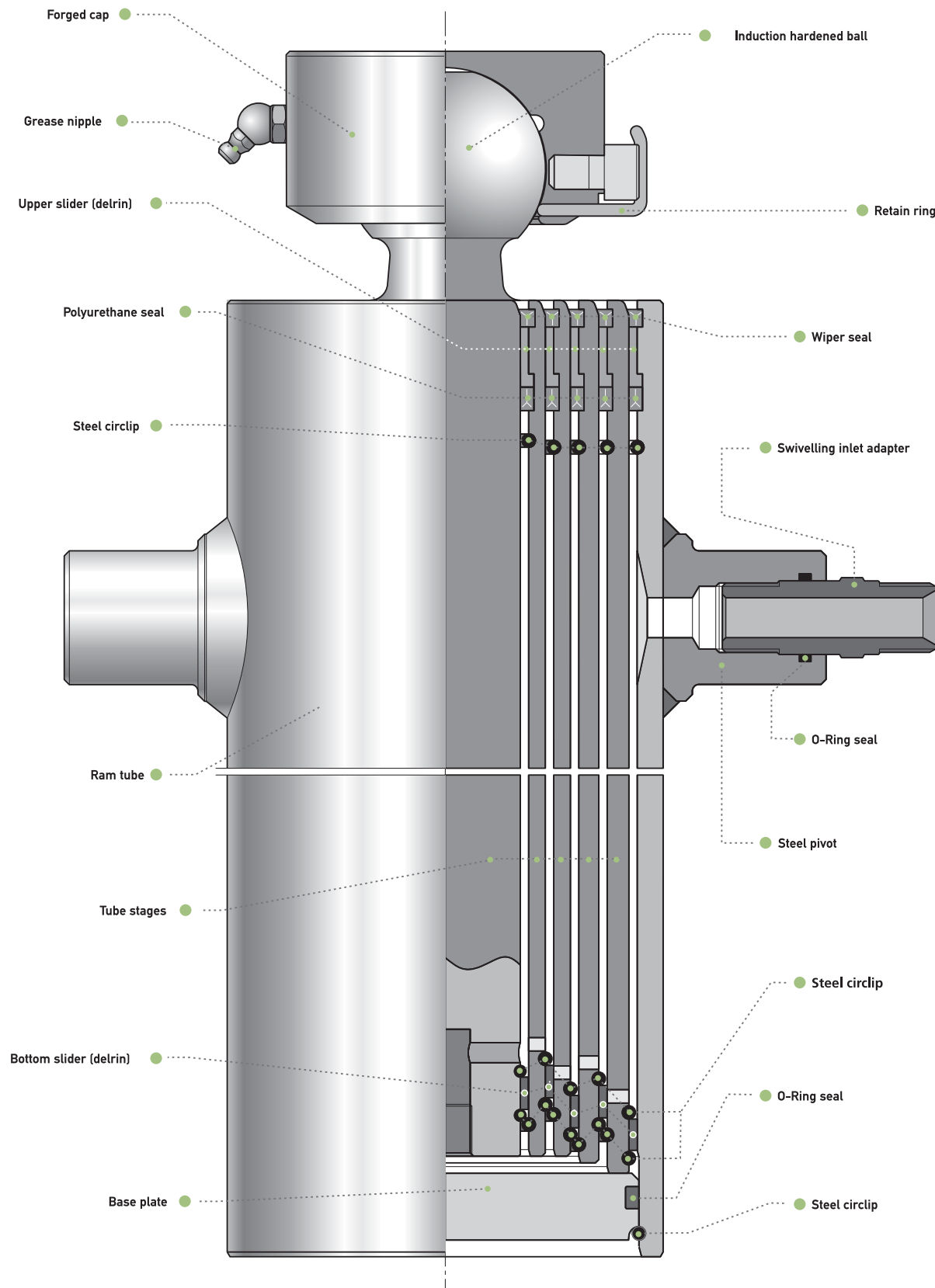
QUICK REFERENCE SELECTION CHART

TYPE	TOTAL MASS [ton]							
	25÷30	20÷25	15÷20	13÷15	11÷13	9÷11	7÷9	4÷7
L174	6	7	8					
L160	5	6	7					
L140		4	5	6				
L120			3	4	5	6		
L105					3	4	5	6
L90						3	4	5
L75							2	3



• Depending on the total tipping weight, the chart identifies the most suitable model and number of stages available.

Assembly



Warnings

This catalogue lists the whole range of H.S. PENTA under-body hoists for tippers, standard type. Telescopic cylinders are commonly installed on dumping vehicles and are devices which are intended to provide only a lifting force. The machinery into which the cylinders are incorporated must comply with the requirements of the in force directives and norms. The cylinders is not a structural member, and is not designed, nor intended to provide stability to the dumping vehicle.

Fitment suggestions and operating conditions. The normal application of multi-stage cylinder is to lift up tipping bodies, loaded with different materials, and consequently discharge this material whilst the cylinder is extended all along its stroke. The body weight plus the payload are the total lifting weight that must be raised by the cylinder. This value, calculated at the working pressure, is a rough indication of the tipping power of the cylinder. The cylinders have been sized for loads along the longitudinal axis (e.g. no side load is admitted).

A few hints for correct fitment of the cylinder:

- 1) Protect the top of the cylinder from welding spatter, or other foreign particles;
- 2) Always fit a relief valve in the hydraulic pressure line. The relief valve must be set at a pressure lower than the max admitted for the cylinder (see specification for each cylinder);
- 3) Fit a filter in the hydraulic line, flush the oil tank and pipes, use good quality hydraulic oil;
- 4) The tipper body should not rest on the cylinder. The cylinder should be extended at least 20 mm (when the tipper body is fully loaded).

Further information please see "Hydraulic cylinder for tipping equipment user & maintenance manual – General safety regulations".

Guarantee

1. Guarantee conditions

1.1 H.S.PENTA S.P.A. (hereinafter referred to as the "Company") guarantees the satisfactory operation of its hydraulic components, hydraulic cylinders, and respective accessories (hereinafter jointly referred to as the "Products") and the absence of flaws and defects in the same within the limits specified in these General Guarantee Conditions.

1.2 This guarantee of satisfactory operation has a validity of two (2) years from the date of sale of the Products.

1.3 The Company guarantees the conformity of the Products exclusively to Italian and European Community standards.

2. Guarantee coverage

2.1 Without prejudice to the content of the following Article 2.2 regarding hidden defects, the Products will be considered as having been accepted by the purchaser whenever within 5 days from delivery such latter has not provided the Company with written notice of the presence of flaws and/or defects.

2.2 Upon pain of relinquishing rights to coverage under the guarantee, the purchaser must provide the Company with written notice of the defect in conformity and/or flaw in the Product or part of the same, specifying the nature of the same in detail within 8 days of the date in which the purchaser has observed such defect in conformity and/or flaw.

2.3 The defective Products reported in such notice as per the sense and effect of Article 2.2 above must be conserved by the purchaser for the purpose of examination by the Company. Following written request from the Company, the purchaser must send the defective Product(s) carriage paid to the latter or the party indicated by the same; whenever after the Company's examination, the Product is declared defective and as such is covered by these General Guarantee Conditions, the Company will reimburse the purchaser for the costs of shipping, while remaining expressly specified that such shipping costs must be within the average reference costs. The purchaser relinquishes the right to coverage under guarantee whenever he does not permit every reasonable inspection of the Product requested by the Company or whenever after receiving written request from the Company for the return of the Product he fails to do so within 30 days of receiving such request.

2.4 Following transmission of due notice by the purchaser performed as per the sense and effect of previous Article 2.2, after ascertaining the existence of the defect or flaw, the Company can take any of the following courses of action at its own discretion:

- (a) provide the purchaser with Products in replacement of those defective free-of-charge;
- (b) repair the Products directly or through third parties at its own expense; or
- (c) reimburse the price paid by the purchaser for the Products ascertained defective.

It is hereby agreed that any Products supplied in replacement of those proven defective must be shipped "ex-works" and that the defective Products returned to the Company will remain the property of such latter.

2.5 With the exception of those mentioned in Article 2.4 above, the costs and expenses incurred by the replacement or repair of the defective Products must be borne by the purchaser. For mere purposes of example without excluding others, the purchaser must bear the costs for:

- (a) consumptions caused by the removal of the defective Products from the machinery in which they were installed and the subsequent re-installation of the same;
- (b) the transport of materials and/or equipment;

- (c) lubricants and/or expendable materials necessary for the replacement or repair of the defective Products;
- (d) the re-painting of the Products;
- (e) the transfer expenses of the Company's personnel during checking for flaws and defects reported by the purchaser.

2.6 Nothing will be due to the purchaser by way of compensation for the time that the machinery in which the defective Products are installed remain out of operation for the repair or replacement of the same, and the Company must be considered expressly released from liability for any direct or indirect damage, cost or expense derived by such machinery inactivity.

2.7 For the parts of the Product replaced or repaired, the guarantee will be automatically extended for a new 2-year period from the date of such replacement or repair.

2.8 Except in case of fraudulent intention or serious neglect, the Company will not be liable in any way for any direct or indirect damage, cost, loss, or expense to persons and/or property derived from the operation and use of the Products and/or the interruption of activity of the machinery in which the Products are installed, given that the guarantee specified in Article 2 is the only remedy in the purchaser's favour.

3. Guarantee exclusions

3.1 The Company will not provide guarantee coverage for defects in conformity and/or flaws in the Product or any of its parts for any of the following cases:

- (a) reasons due or linked to normal wear;
- (b) the failure of the purchaser to correctly perform the procedures for the installation, use (or equivalent), and maintenance of the Products specified in the Use and Maintenance manual provided by the Company together with the Products;
- (c) the incorrect use and/or operation of the Products or accident caused by the negligence, inexperience, or imprudence of the purchaser;
- (d) the inadequate maintenance of the Products by the purchaser or modifications, repair and/or replacement made by the same without the Company's written consent;
- (e) shock or impact against the vehicle or machinery in which the Products are installed; and
- (f) causes other than defects in fabrication and/or engineering, working, and/or materials.

3.2 Guarantee coverage will also be excluded whenever:

- (a) the Company is not placed in the conditions to promptly perform the necessary repair or replacement of defective Products;
- (b) the Products are modified by the purchaser;
- (c) the Products are used after the discovery of a flaw or defect;
- (d) Repairs that are not authorized by the Company are made;
- (e) the flaw or defect regards paint coatings and/or is represented by the corrosion of parts of the Product coated or not coated.

4. Applicable Law - Controversy

4.1 These General Guarantee Conditions are regulated by Italian Law with the express exclusion of the application of the United Nations Convention on international movable property sales contracts.

4.2 Any controversy derived from these General Guarantee Conditions, including those regarding their validity, interpretation, execution and resolution that cannot be settled out of court will be subjected to the exclusive decision of the Court of Ravenna, Italy.

"General guarantee conditions" 19/11/2008

