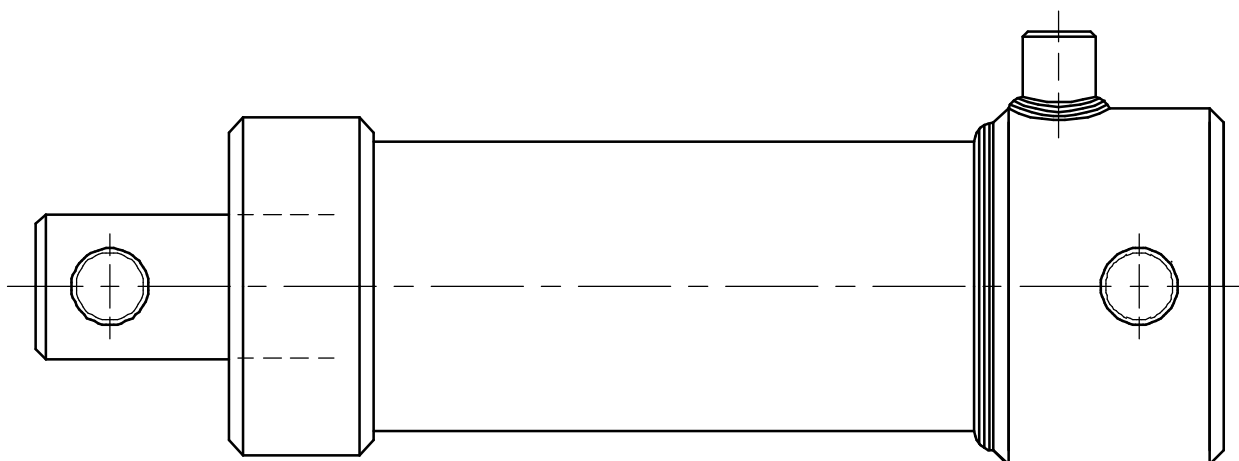


RAM POWER LTD



HYDRAULIC RAMS
SINGLE ACTING METRIC RANGE



RAM POWER LTD

16 Greenhill Crescent, Watford Business Park, Watford, WD18 8SE.
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* Refer to full SAM catalogue or contact us for further details



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General Specifications

This catalogue covers our range of Standard Single Acting Metric rams. These rams utilise a welded construction and are ideal for heavy industrial use. Combined with our company policy of 100% product testing and years of experience, we produce a comparatively low cost product on short lead times with no compromise on quality.

This catalogue covers only a small part of the wide range of rams that we produce, if you require a product not listed, or to a modified specification please contact the sales office who will be happy to advise you.

Options available on request include:-

Stainless steel piston rods, marine specification, telescopic, spring return, low friction and chemically resistant seals, limit switches, position transducers and two pack epoxy paint finish.

Maximum pressure rating (see note 1)	207 Bar (3000 PSI)
Test pressure	310 Bar (4500 PSI)
Maximum rod velocity	0.5 m/s
Fluid temperature range	-10 to +90 degrees C
Ambient temperature range	-10 to +90 degrees C
Filtration requirement	25 micron abs, (recommended min.)
Fluid specification	Mineral Oil DIN51524+51525 HL, H-LP & HV ISO HM (see note 2)
Fluid viscosity	5 to 200 cSt
Rod finish	20 micron hard chromium plate min Ra.=0.4

Note 1,

Maximum pressure rating should not be exceeded, allowance must be made for pulsation and pressure peaks. The customer must ensure that damping pressures do not exceed the maximum pressure rating.

Note 2,

For use with other fluids please contact our sales office. To ensure that testing is carried out with the correct grade of fluid and that all materials are compatible, please state the fluid type when making an order. If no fluid type is specified mineral oil will be assumed.

The information contained in the publication is for guidance only . We reserve the right to make changes without notice. The responsibility for checking calculations, formulae, graphs and tables lies with the customer. The vendor will accept no responsibility for any loss or accident howsoever caused. Certified drawings are available on request.



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Part Numbering System

100-70-SAM0-0250

BORE & ROD DIAMETER in mm

25 - 19 = 25mm bore, 19mm rod
 32 - 25 = 32mm bore, 25mm rod
 40 - 28 = 42mm bore, 28mm rod
 50 - 40 = 50mm bore, 40mm rod
 63 - 40 = 63mm bore, 40mm rod
 80 - 50 = 80mm bore, 50mm rod
 100 - 70 = 100mm bore, 70mm rod
 125 - 90 = 125mm bore, 90mm rod

STROKE in mm

Refer to data sheets and buckling calculations for maximum values.

Single Acting Metric ram style

Type of Mounting	<u>WITHOUT</u>			<u>WITH</u>		
	Male Rod End	Female Rod End	PBV Pinhole In Rod End	Male Rod End	Female Rod End	PBV Pinhole In Rod End
Pin Mounted	SAM0M	SAM0	SAM1	SAM4M	SAM4	SAM5
Pin Mounted with Damping	SAM2M	SAM2	SAM3	SAM6M	SAM6	SAM7
Bushed	SAM16M	SAM16	SAM17	SAM20M	SAM20	SAM21
Bushed with Damping	SAM18M	SAM18	SAM19	SAM22M	SAM22	SAM23
Spherical Eye	SAM32M	SAM32	SAM33	SAM36M	SAM36	SAM37
Spherical Eye with Damping	SAM34M	SAM34	SAM35	SAM38M	SAM38	SAM39
Front Flange	SAM48M	SAM48	SAM49	SAM52M	SAM52	SAM53
Rear Flange	SAM64M	SAM64	SAM65	SAM68M	SAM68	SAM69
Trunnion	SAM96M	SAM96	SAM97	SAM100M	SAM100	SAM101

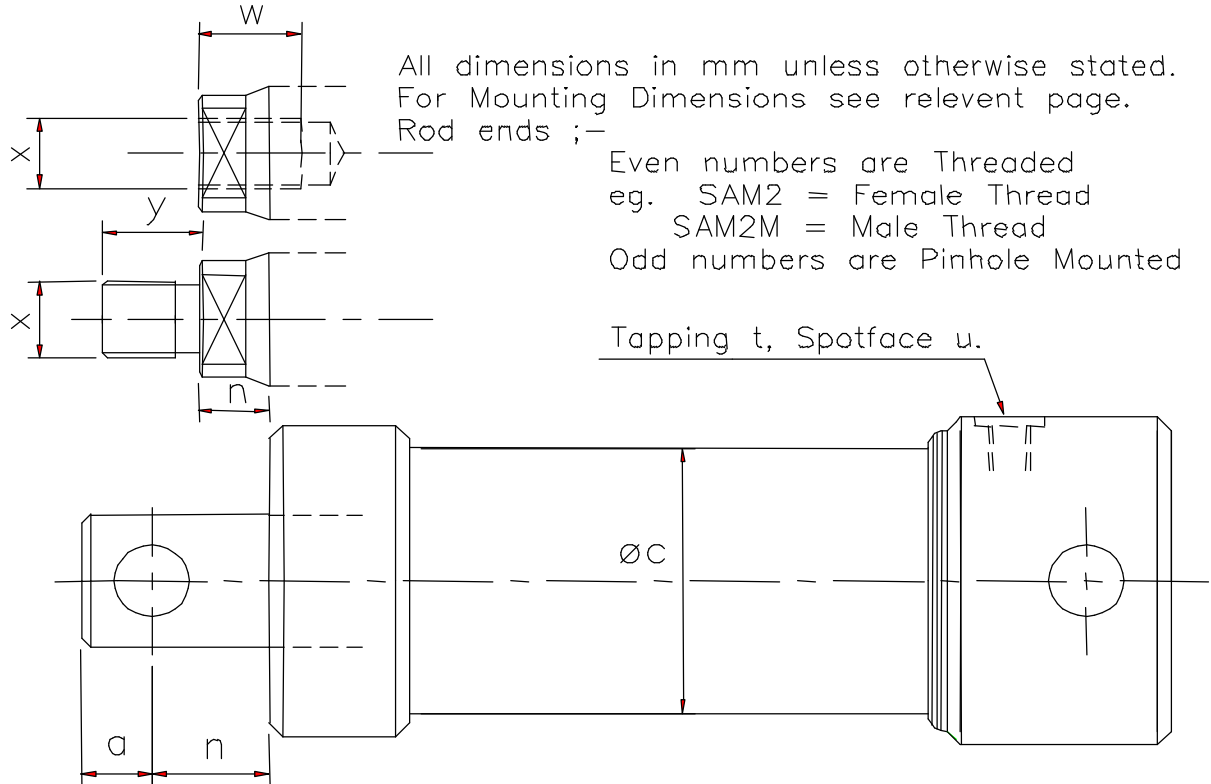


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Basic Dimensions

The dimensions on this page are common to all the following single acting rams.



TYPE No.	BORE Ø	ROD Ø	THRUST AREA CM ²	PULL AREA CM ²	a	c Ø	n Pin	n Thrd	t BSP *	u	w	y	x
25-19-SAM_	25	19	5.0	2.1	10	38	13	10	1/4"	22	25	25	M10x1.50
32-25-SAM_	32	25	8.0	3.1	11	39	14	12	1/4"	22	25	30	M12x1.75
40-28-SAM_	40	28	12.6	6.4	14	50	17	14	3/8"	25	30	42	M16x2.00
50-40-SAM_	50	40	19.6	7.1	18	60	22.5	15.5	3/8"	25	40	48	M20x1.50
63-40-SAM_	63	40	31.2	18.6	18	73	28	16	3/8"	25	45	58	M24x2.00
80-50-SAM_	80	50	50.2	30.6	25	95	33	18	3/8"	25	55	68	M30x2.00
100-70-SAM_	100	70	78.5	40.0	35	115	45	22	1/2"	30	75	80	M39x3.00
125-90-SAM_	125	90	122.7	59.1	40	145	60	24	1/2"	30	90	86	M45x3.00

25 & 32 bore rams complete with PBV have 3/8" ports



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Buckling Calculations

The safe working load may be determined from the formula:

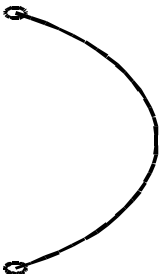
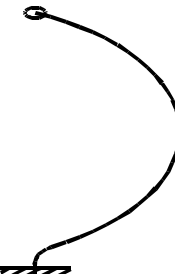
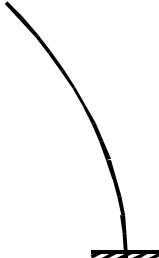
The safe Working Load = Buckling Force x c / FoS

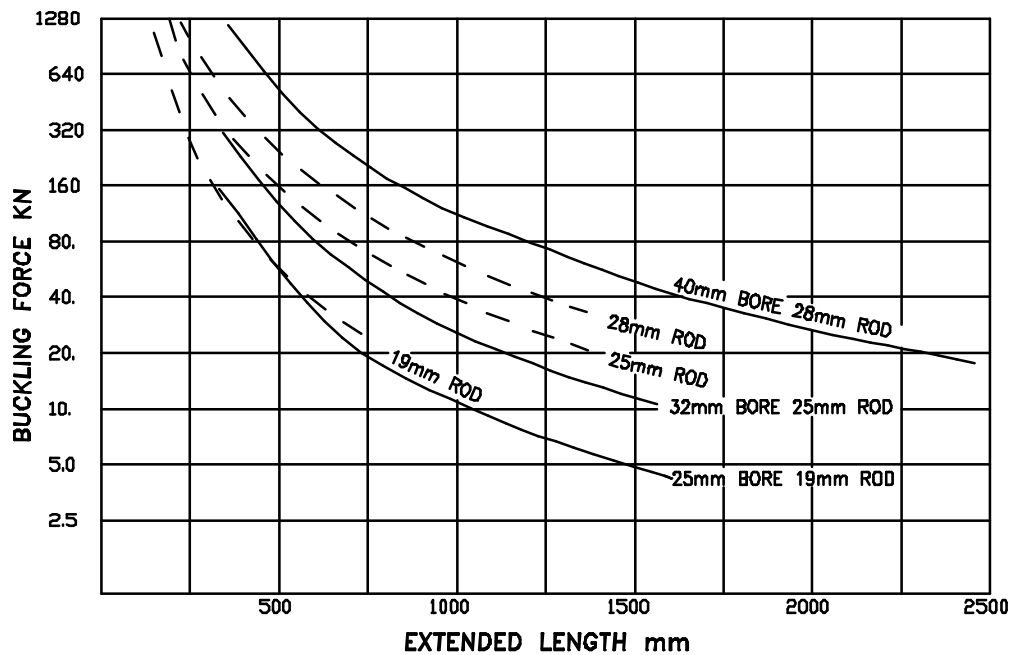
Where:- c is a constant determined from the table below.

FoS is the required Factor of Safety, we recommend a minimum of 3. Where shock loads are present this should be doubled.

The actual force to cause buckling may be determined from the following graphs. Note the solid curves are for rear mountings (SAM0, SAM1, SAM2, SAM3, SAM16, SAM17, SAM32, SAM33, SAM64, SAM65) and the dashed curves are for front flange or front trunnion mounted rams (SAM48, SAM49, SAM96 & SAM97).

The extended length refers to the distance between the mounting points of the ram, effectively the extended rod length for front end mounted rams.

Both ends rounded eg. Pin or Trunnion mounted	One end fixed, One end rounded eg. Flange mounted c/w spherical eye.	One end fixed, One end free eg. Flange or Foot mounted
 <p style="text-align: center;">c = 1</p>	 <p style="text-align: center;">c = 2</p>	 <p style="text-align: center;">c = 0.25</p>

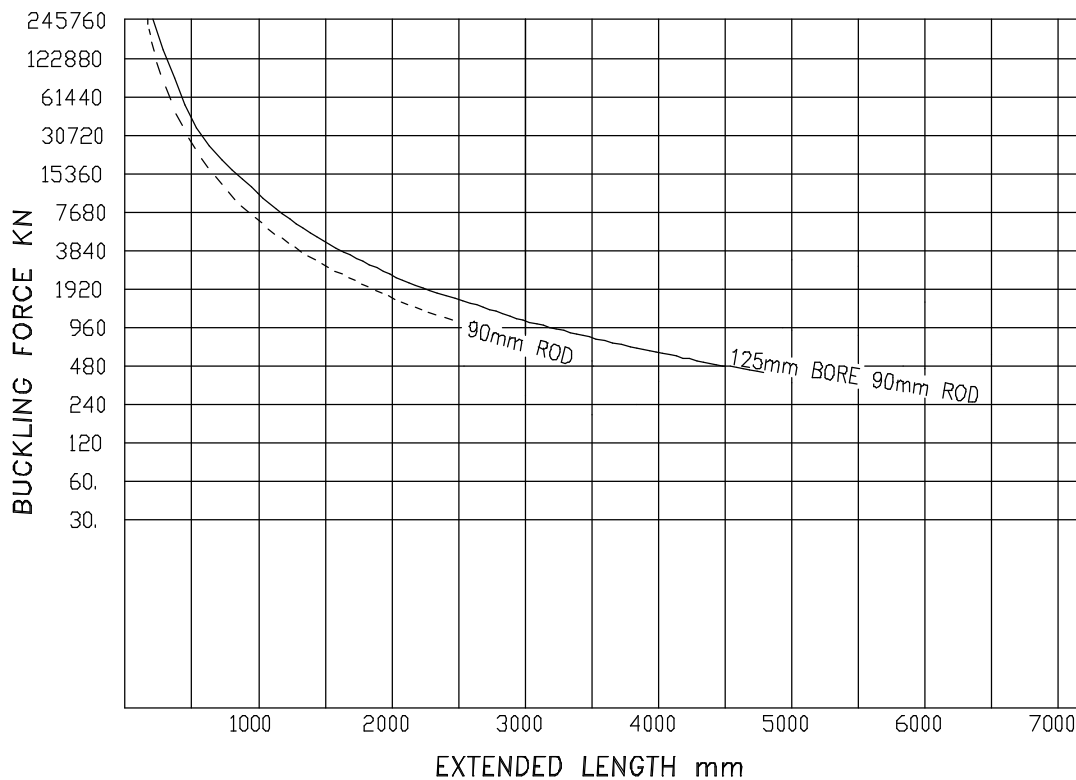
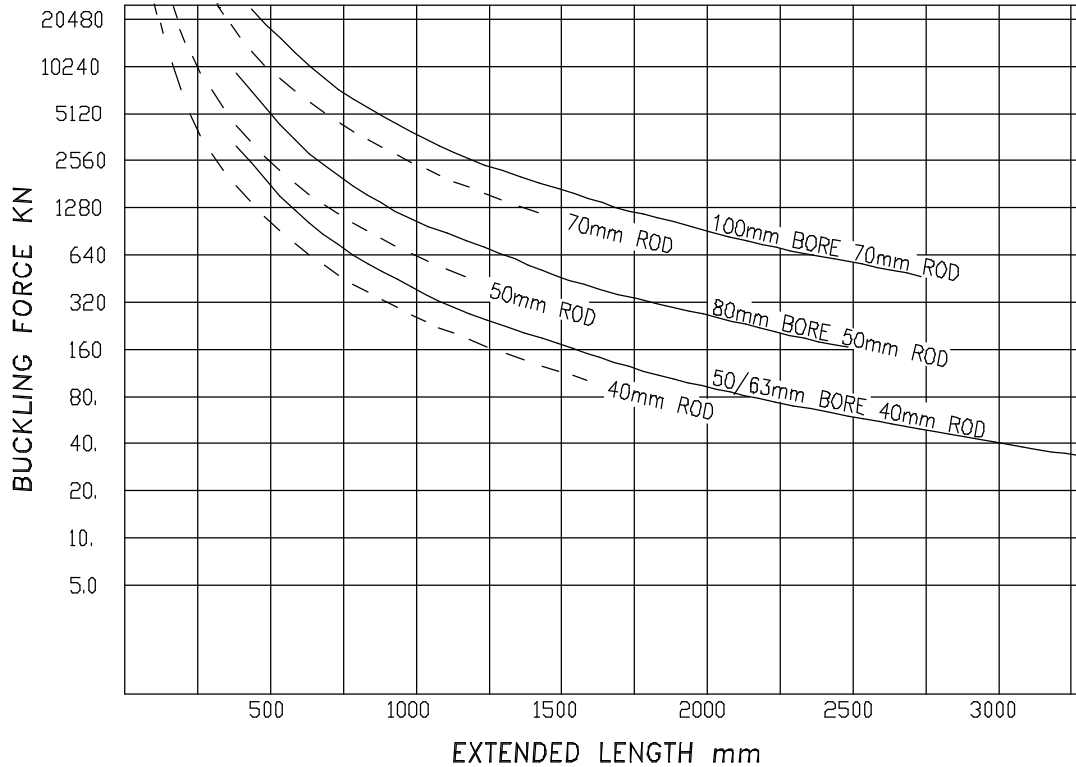




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Buckling Force /Length Graphs



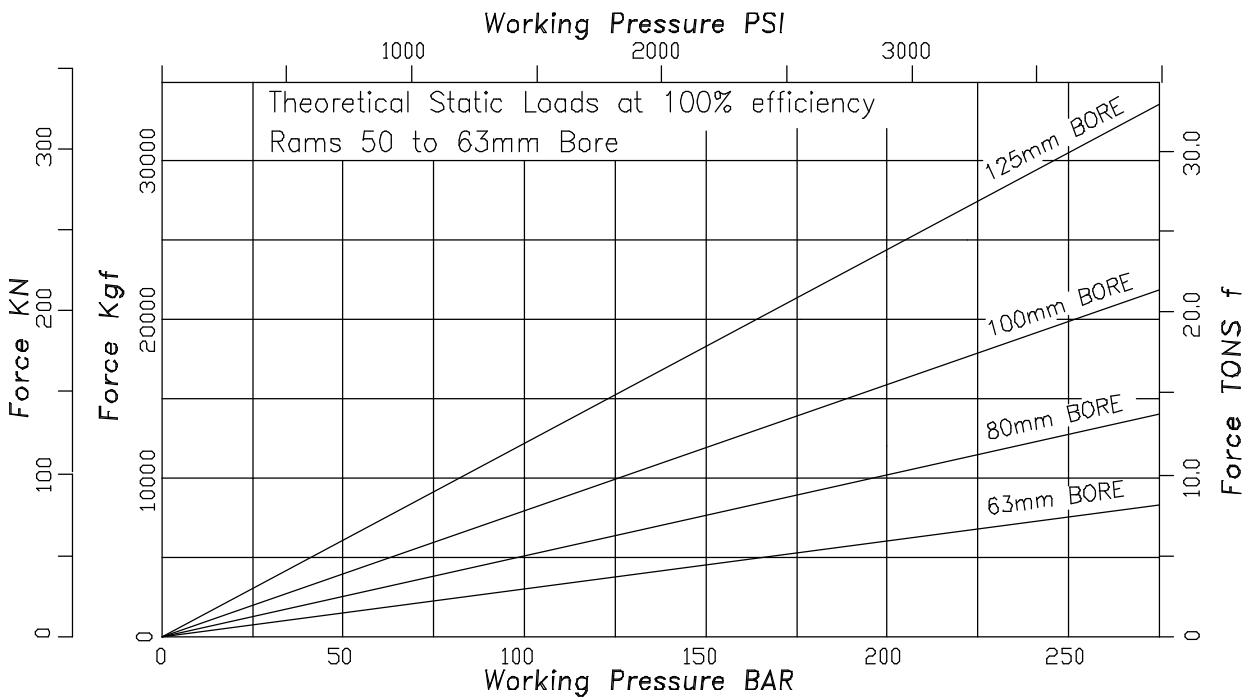
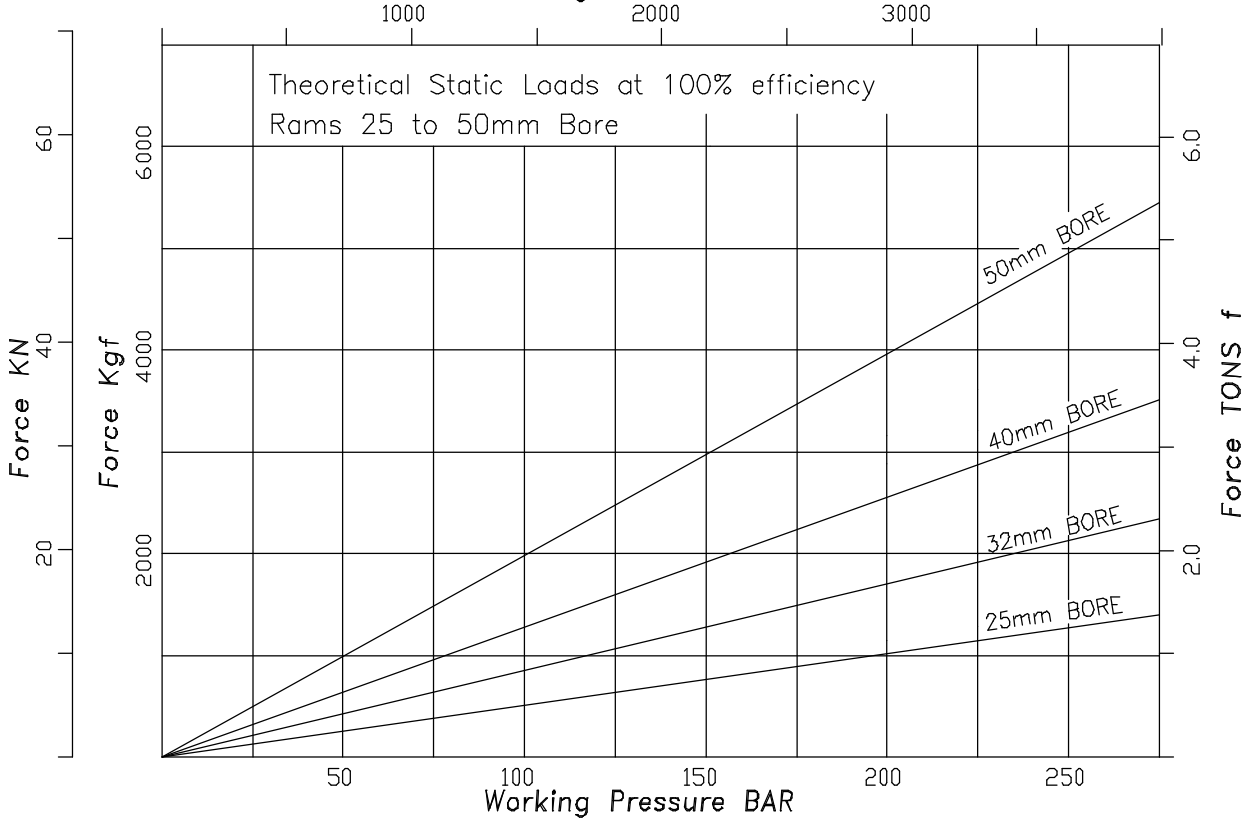


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Load Calculations

Working Pressure PSI



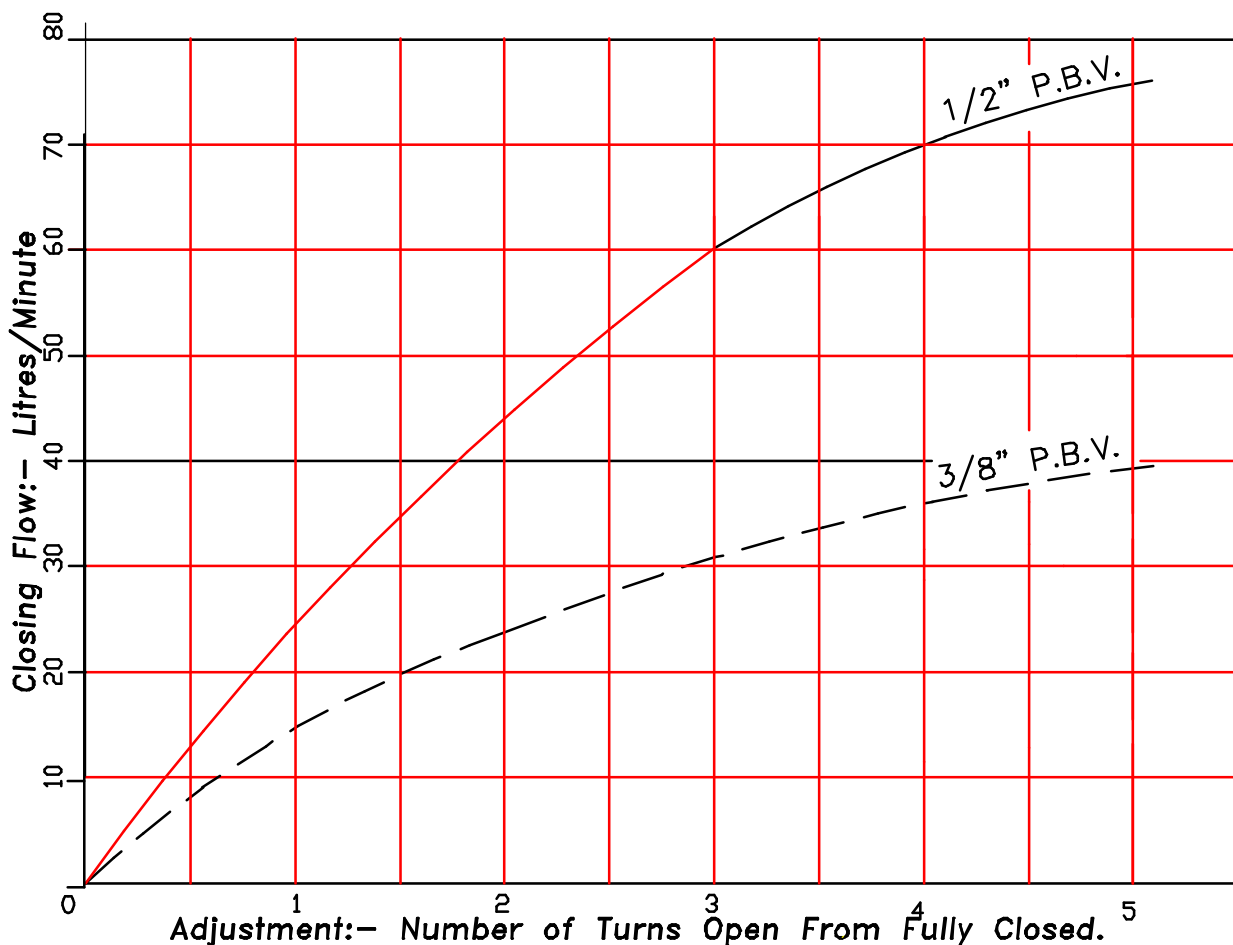


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Pipe Break Valve (PBV) Flow Chart

Pipe Break Valves may be installed as a safety device. They may be considered as a flow fuse when oil flow leaving the hydraulic ram exceeds the present flow rate of the valve, such as when a hose has failed the valve automatically closes, stopping oil flow out of the ram, and hence preventing any further descent in the ram. In order to release the valve, oil pressure must be applied to the connection port.



Corresponding test conditions:-

- Oil type = Shell Tellus 37
- Oil viscosity = 76cSt (10°E)
- Ambient temperature = 25°C

Note: 25 & 32mm bore rams which are normally supplied with 1/4" BSP ports are fitted with 3/8" BSP ports when supplied with integral PBV.

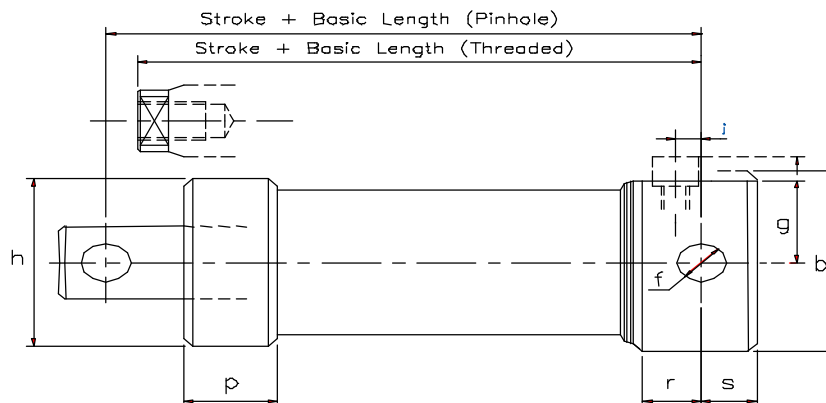


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Pin Mounted Rams

Note: If rams are required for angular movements, bushes or spherical end bearings should be considered.



All Dimensions in mm.

Type No.	b ø	f ø	g	h ø	j	p	r	s	Basic length (Pin.)	Basic Length (Thr.)	Stroke Range
25-19-SAM 0/1	38	10.5	29	44.5	13	26	27	10	98 148	95 145	10-400 401-800
32-25-SAM 0/1	45	12.5	20	45	13	25	26	11	97 137	95 135	10-350 351-725
40-28-SAM 0/1	55	17.5	25	55	15	25	30	14	100 150 200	97 147 197	10-457 458-850 851-1350
50-40-SAM 0/1	70	20.5	32	70	0	35	15	18	115 165 215	108 158 208	10-500 501-1000 1001-1500
63-40-SAM 0/1	80	25.4	40	85	0	30	14	18	120 170 220	108 158 208	10-610 611-1000 1001-1500
80-50-SAM 0/1	100	30.5	48	100	4	40	22	25	155 205 255	140 190 240	10-600 601-1100 1101-1600
100-70-SAM 0/1	130	40.5	62	130	11	52	30	35	185 235 285	162 212 262	10-650 651-1150 1151-1650
125-90-SAM 0/1	150	50.5	72	150	15	50	35	43	233 313 393	197 277 357	10-750 751-1500 1501-2200

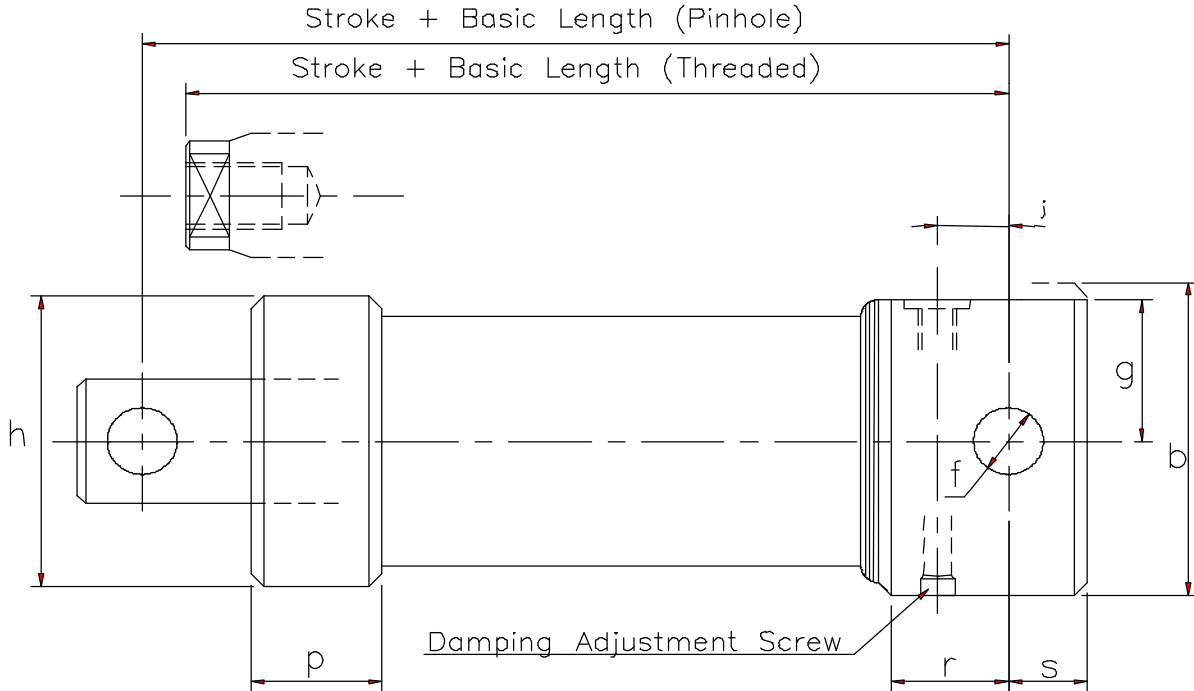


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Pin Mounted Rams with Damping

Note: Damping must be adjusted to ensure excessive impulse pressures are not induced.



Type No.	b ø	f ø	g	h ø	j	p	r	s	Damping Length	Basic length (Pin.)	Basic length (Thr.)	Stroke Range
25-19-SAM 2/3	45	10.5	20.5	44.5	15	26	29	10	15	121 171	118 168	10-400 401-800
32-25-SAM 2/3	45	12.5	20	45	16	25	28	11	15	122 162	120 160	10-350 351-725
40-28-SAM 2/3	55	17.5	25	55	20	25	33	14	25	113 163 213	110 160 210	10-457 458-850 851-1350
50-40-SAM 2/3	70	20.5	32	70	23	35	36	18	25	145 195 245	138 188 238	10-500 501-1000 1001-1500
63-40-SAM 2/3	80	25.4	40	85	28	30	44	18	25	158 208 258	146 196 246	10-610 611-1000 1001-1500
80-50-SAM 2/3	95	30.5	48	100	30	40	45	25	25	181 231 281	166 216 266	10-600 601-1100 1101-1600
100-70-SAM 2/3	115	40.5	57.5	130	40	52	57	35	25	224 274 324	201 251 301	10-650 651-1150 1151-1650
125-90-SAM 2/3	150	50.5	75	150	45	50	64	43	25	298 378 458	262 342 422	10-750 751-1500 1501-2200

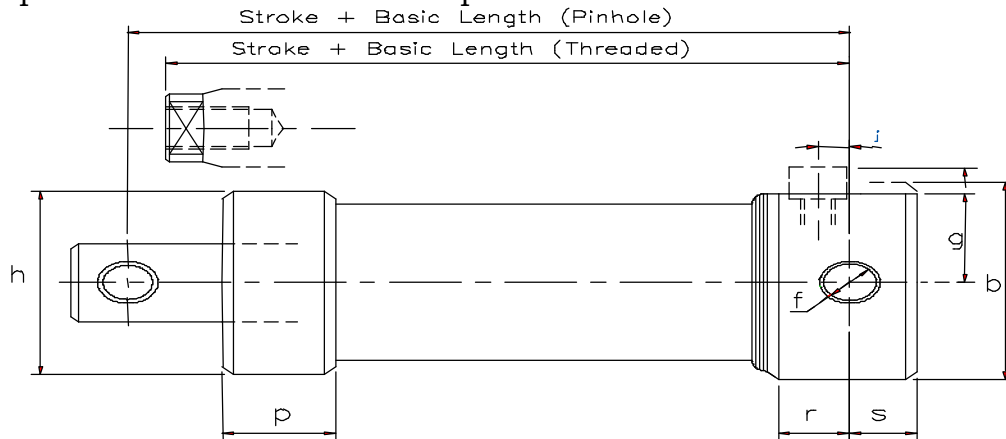


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Bushed Pin Mounted Rams

Bushed pin hole to suit f7 tolerance pins.



All dimensions in mm

Type No.	b ø	f ø	g	h ø	j	p	r	s	Basic Length (Pin.)	Basic Length (Thr.)	Stroke Range
25-19-SAM 16/17	38	10	29	44.5	13	26	27	10	98 148	95 145	10-400 401-800
32-25-SAM 16/17	45	12	20	45	13	25	26	11	97 137	95 135	10-350 351-725
40-28-SAM 16/17	55	17	25	55	15	25	30	14	100 150 200	97 147 197	10-457 458-850 851-1350
50-40-SAM 16/17	70	20	32	70	0	35	15	18	115 165 215	108 158 208	10-500 501-1000 1001-1500
63-40-SAM 16/17	80	25	40	85	0	30	17	18	120 170 220	108 158 208	10-610 611-1000 1001-1500
80-50-SAM 16/17	100	30	48	100	4	40	22	25	155 205 255	140 190 240	10-600 601-1100 1101-1601
100-70-SAM 16/17	130	40	62	130	11	52	30	35	185 235 285	162 212 262	10-650 651-1150 1151-1650
125-90-SAM 16/17	150	50	75	150	15	50	35	43	233 313 393	197 277 357	10-750 751-1500 1501-2200

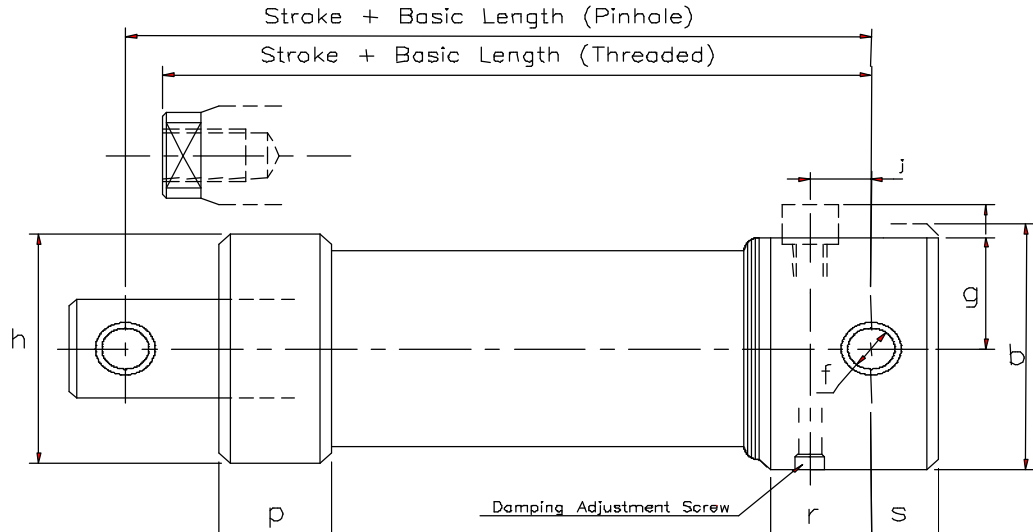


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Bushed Pin Mounted Rams with Damping

Bushed pin holes to suit f7 toleranced pins.



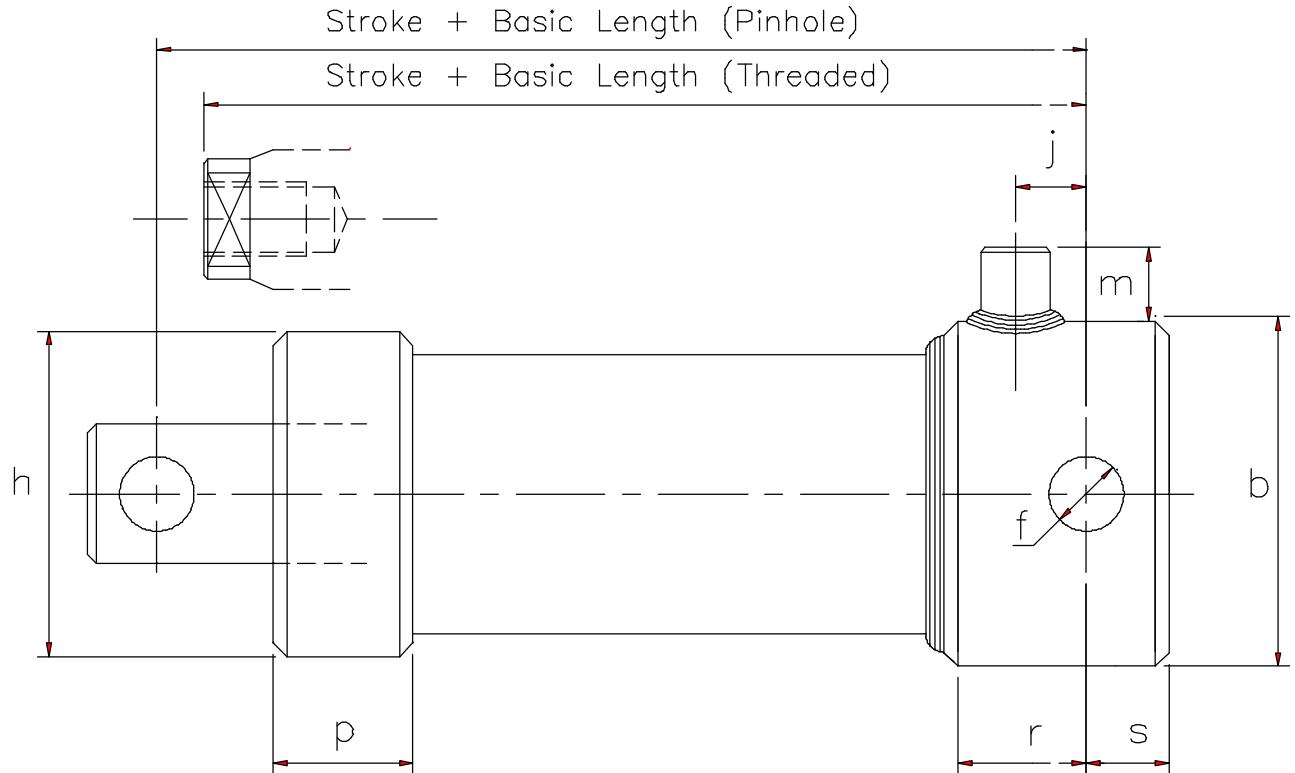
Type No.	b ø	f ø	g	h ø	j	p	r	s	Damped Length	Basic Length (Pin.)	Basic Length (Thr.)	Stroke Range
25-19-SAM 18/19	45	10	20.5	44.5	15	26	29	10	15	121 171	118 168	10-400 401-800
32-25-SAM 18/19	45	12	20	45	16	25	28	11	15	122 162	120 160	10-350 351-725
40-28-SAM 18/19	55	17	25	55	20	25	33	14	25	113 163 213	110 160 210	10-457 458-850 851-1350
50-40-SAM 18/19	70	20	32	70	23	35	36	18	25	145 195 245	138 188 238	10-500 501-1000 1001-1500
63-40-SAM 18/19	80	25	40	85	28	30	44	18	25	158 208 258	146 196 246	10-610 611-1000 1001-1500
80-50-SAM 18/19	95	30	48	100	30	40	45	25	25	181 266 351	166 251 336	10-600 601-1100 1101-1601
100-70-SAM 18/19	115	40	57.5	130	40	52	57	35	25	224 274 324	201 251 301	10-650 651-1150 1151-1650
125-90-SAM 18/19	150	50	75	150	45	50	64	43	25	293 378 458	262 342 422	10-750 751-1500 1501-2200



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Pin Mounted Rams with PBV



All dimensions in mm

Type No.	b	f	h	j	m	p	r	s	Basic Length (Pin)	Basic Length (Thr)	Stroke Range
25-19-SAM 4/5	38	10.	44.	19	20	26	30	10	101	98	10-400
		5	5						151	148	401-800
32-25-SAM 4/5	45	12.	45	22	15	25	35	11	107	105	10-350
		5							147	145	351-725
40-28-SAM 4/5	55	17.	55	17	29	25	31	14	100	97	10-457
		5							150	147	458-850
									200	197	851-1350
50-40-SAM 4/5	70	20.	70	20	24	35	38	18	135	128	10-500
		5							185	178	501-1000
									235	228	1001-1500
63-40-SAM 4/5	80	25.	85	14	27	30	30	18	137	125	10-610
		4							187	175	611-1000
									237	225	1001-1500
80-50-SAM 4/5	100	30.	100	4	22	40	22	25	155	140	10-600
		5							205	190	601-1100
									255	240	1101-1600
100-70-SAM 4/5	130	40.	130	8	28	52	27	35	185	162	10-650
		5							235	212	651-1150
									285	262	1151-1650
125-90-SAM 4/5	150	50.	150	15	26	50	37	43	233	197	10-750
		5							313	277	751-1500
									393	357	1501-2200

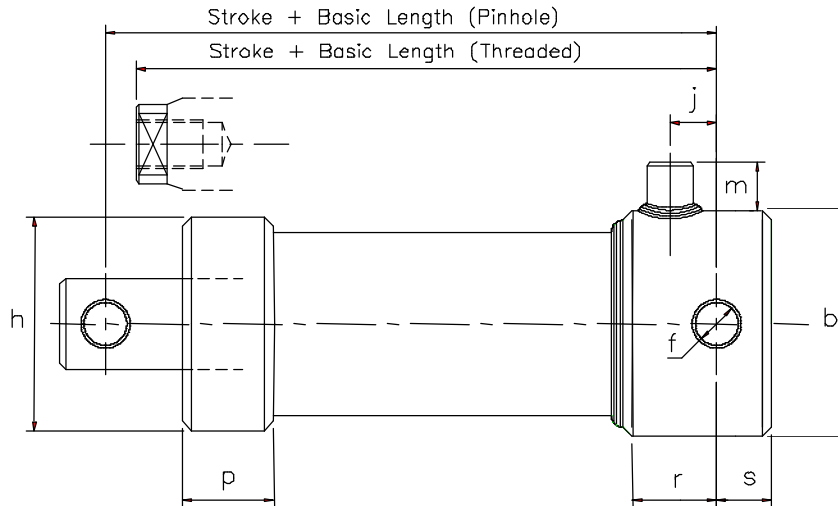


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Bushed Pin Mounted Rams with PBV

Bushed pin holes to suit f7 tolerance pins.



Type No.	b	f ø	h ø	j	m	p	r	s	Basic Length (Pin)	Basic Length (Thr)	Stroke Range
25-19-SAM 20/21	38	10	44.5	19	20	26	32	10	101 151	98 148	10-400 401-800
32-25-SAM 20/21	45	12	45	22	15	25	37	11	110 150	108 148	10-350 351-725
40-28-SAM 20/21	55	17	55	17	29	25	32	14	100 150 200	97 147 197	10-457 458-850 851-1350
50-40-SAM 20/21	70	20	70	20	24	35	40	18	135 185 235	128 178 228	10-500 501-1000 1001-1500
63-40-SAM 20/21	80	25	85	14	27	30	30	18	137 187 237	125 175 225	10-610 611-1000 1001-1500
80-50-SAM 20/21	100	30	100	4	22	40	22	25	155 205 255	140 190 240	10-600 601-1100 1101-1600
100-70-SAM 20/21	130	40	130	8	28	52	30	35	185 235 285	162 212 262	10-650 651-1150 1151-1650
125-90-SAM 20/21	150	50	150	15	26	50	37	43	233 313 393	197 277 357	10-750 751-1500 1501-2200

All Dimensions in mm.



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Spares

We supply an extensive range of hydraulic spares for every item that we have manufactured, including piston rods, cylinders and seal kits. Please ensure that you always state the ram serial number when ordering spares. This will be stamped onto the bottom end or around the flange or trunnion.

Installation and Maintenance

1. Storage

Port plug must always be left in until pipe connections are to be made. Rams should be oiled and stored in a clean dry atmosphere. They should be vertical to prevent seal set and should not be stored for in excess of 24 months without manufacturers overhaul.

2. Installation

Piping must be thoroughly cleaned and deburred before connection. Sealing agents such as hemp and putty must not be used. Ensure all moving surfaces are correctly lubricated. Rams must be installed free from bending forces and side loads. Initially the system should be cycled at low pressure. All air must be bled from the system to ensure satisfactory function. This may be carried out by cracking pipe joints at the highest points in the system. Only agreed types and grades of fluids may be used.

3. Maintenance

Good fluid condition is essential for maximum ram life. Contaminated or aged fluid should be replaced, not topped up.

If the rod or bore shows signs of marking the unit should be returned to the manufacturer for overhaul. Seal life is dependent on working conditions, particularly the fluid condition, working atmosphere, temperature and speed. Impulse and shock pressures are especially inclined to reduce seal life.

Ensure system pressure is dumped and loads are otherwise supported before attempting maintenance.

Rams should be thoroughly cleaned prior to reassembly.

Abrasive dust and chemicals should not be allowed on, or around, the piston rod as this will advance seal wear and may initiate rod corrosion.