

The logo features a stylized circular emblem on the left, composed of concentric red and blue rings with a white center. To the right of the emblem, the word "BSA" is written in a large, bold, red sans-serif font with a white outline. Below "BSA", the words "TUBE RUNNER" are written in a smaller, bold, blue sans-serif font with a white outline. A small red wing-like graphic is positioned above the "A" in "BSA".

BSA **TUBE RUNNER**



*Manufacturer & supplier of quality machines, equipment & tooling for
heat exchangers, coolers, condensers, boilers, tubes & pipework*



We have over 25 years of expertise in the manufacture and supply of a wide range of machines and equipment, servicing the demanding requirements of the oil, gas, power generation and refining industries.

We offer a comprehensive range of high quality products for use in the manufacture, reconditioning and refurbishment of heat exchangers, boilers, condensers and other refinery equipment. We stock such items as tube extraction equipment, tube expanders and expander drives.

We offer a wide range of pipeworking tools, including bevelling and cutting machines for the preparation of pipe and tube for welding. We also offer clamps, stands, flange spreaders and flange facers to assist in the assembly and maintenance of industrial piperuns.

ISO 9001 registered, our products are designed and manufactured using quality materials to exacting standards.

Here at Tube Runner we understand that no two jobs are the same, with this in mind we can offer a bespoke service to tailor products to meet your exact specifications and needs.


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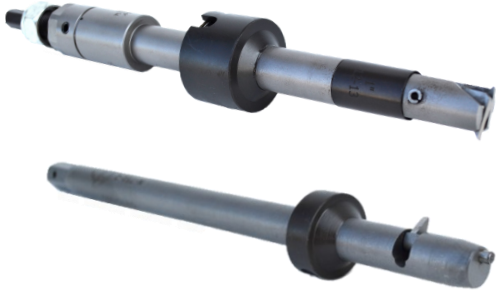
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TUBE REMOVAL

JAVELIN

TUBE PULLING MACHINE



The JAVELIN is a compact and dependable Tube Pulling machine, designed for continuous removal of tubes from Heat Exchangers, Condensers and Boilers. The Stub Pulling option allows the quick removal of tube stubs without the need to drive in mandrels.

The powerpack is available in a range of voltages for workshop and low hazard areas, or as Fully Pneumatic Powerpack, designed especially for use in hazardous environments. Equipped with a 2 stage pump it provides high force when needed and increased speed when it is not.

The powerpack can be combined with any of the pulling gun options:

The 30 Ton gun can pull tubes continuously from between **12.5mm (½") and 32mm (1 ¼") OD.**

The 60 Ton Gun can pull tubes continuously from between **38mm (1 ½") and 51mm (2") OD.**

The Collet Type Stub Puller automatically grips, pulls and releases stubs between **16mm (5/8") and 38mm (1 ½") OD.**

The JAVELIN is versatile machine; essential for contractors with tight access or sample extractions. It is ideal for the speedy removal of tube stubs. It can be easily transported and is quick to set-up.



Power options	Details
Electric	110V single phase 240V single phase 400V three phase
Pneumatic	6 Bar, 90 cfm (3.0hp)

Pulling ram	Tube extraction range
15 Ton Stub Puller	16mm – 38mm (5/8" – 1 ½") OD
30 Ton	12.5mm – 32mm (½" – 1 ¼") OD
60 Ton	38mm – 51mm (1 ½" – 2") OD



30 Ton pulling ram	
Min Tube Size OD	12.5mm (1/2")
Max Tube Size OD	32mm (1 1/4")
Max Pull Force	30,000 Kg
Weight	26 Kg (57lbs)
Pulling Stroke	125mm (5")

60 Ton pulling ram	
Min Tube Size OD	38mm (1 1/2")
Max Tube Size OD	51mm (2")
Max Pull Force	60,000 Kg
Weight	31 Kg (68lbs)
Pulling Stroke	102mm (4")

15 Ton stub pulling ram	
Min Tube Size OD	16mm (5/8")
Max Tube Size OD	38mm (1 1/2")
Max Pull Force	15,000 Kg
Weight	13.5 Kg (30lbs)
Pulling Stroke	160mm (6")

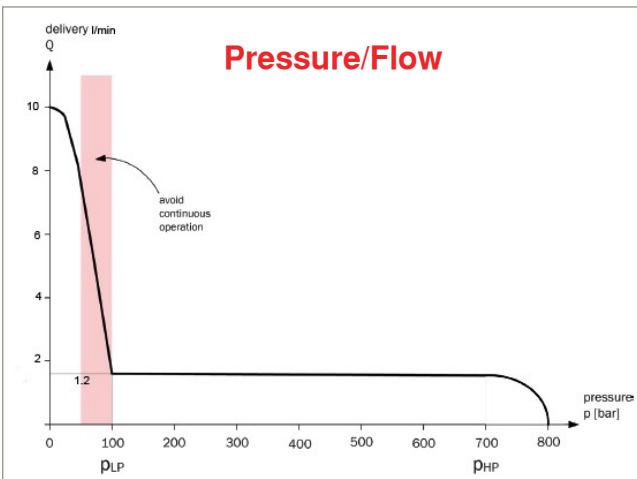
Powerpack	
Dimensions	320 x 350 x 660mm



30 Ton Pulling Ram



60 Ton Pulling Ram



Stub Pulling Ram

Tube Pulling Consumables Suitable for the 30 Ton Ram

Consumables to Suit 12.70mm / ½" OD			
Collar	17.0500	ID Size Range	
Jaw	17.3022		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6000	5.50mm	8.10mm
To Suit 13 – 16 g	17.6001	7.60mm	10.20mm
To Suit 18 – 24 g	17.6002	10.10mm	11.60mm
Consumables to Suit 15.88mm / 5/8" OD			
Collar	17.0625	ID Size Range	
Jaw	17.3032		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6010	8.50mm	11.00mm
To Suit 13 – 16 g	17.6011	11.00mm	13.60mm
To Suit 18 – 24 g	17.6012	13.05mm	15.65mm
Consumables to Suit 19.05mm / ¾" OD			
Collar	17.0750	ID Size Range	
Jaw	17.3042		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6020	12.20mm	14.80 mm
To Suit 13 – 16 g	17.6021	14.10 mm	16.70 mm
To Suit 18 – 24 g	17.6022	16.25 mm	18.85 mm
Consumables to Suit 22.23mm / 7/8" OD			
Collar	17.0875	ID Size Range	
Jaw	17.3047		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6030	15.35 mm	17.95 mm
To Suit 13 – 16 g	17.6031	17.35 mm	19.95 mm
To Suit 18 – 24 g	17.6032	19.50 mm	22.10 mm
Consumables to Suit 25.40mm / 1" OD			
Collar	17.1000	ID Size Range	
Jaw	17.3052		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6040	18.50 mm	21.10 mm
To Suit 13 – 16 g	17.6041	20.50 mm	23.10 mm
To Suit 18 – 24 g	17.6042	22.60 mm	25.20 mm
Consumables to Suit 28.58mm / 1 1/8" OD			
Collar	17.1125	ID Size Range	
Jaw	17.3062		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6050	21.80 mm	24.40 mm
To Suit 13 – 16 g	17.6051	23.80 mm	26.40 mm
To Suit 18 – 24 g	17.6052	25.80 mm	28.40 mm

Tube Pulling Consumables Suitable for the 30 Ton Ram

Consumables to Suit 31.75mm / 1 ¼" OD			
Collar	17.1250	ID Size Range	
Jaw	17.3072		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6060	24.90 mm	27.50 mm
To Suit 13 – 16 g	17.6061	26.90 mm	29.50 mm
To Suit 18 – 24 g	17.6062	28.95 mm	31.55 mm

Tube Pulling Consumables Suitable for the 60 Ton Ram

Consumables to Suit 38.10mm / 1 ½" OD			
Collar	17.3212	ID Size Range	
Jaw	17.3211		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6070	31.30 mm	33.90 mm
To Suit 13 – 16 g	17.6071	33.30 mm	35.90 mm
To Suit 18 – 24 g	17.6072	35.30 mm	37.90 mm

Consumables to Suit 44.45mm / 1 ¾" OD			
Collar	17.3217	ID Size Range	
Jaw	17.3216		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6080	37.70 mm	40.30 mm
To Suit 13 – 16 g	17.6081	39.70 mm	42.30 mm
To Suit 18 – 24 g	17.6082	41.70 mm	44.30 mm

Consumables to Suit 50.80mm / 2" OD			
Collar	17.3222	ID Size Range	
Jaw	17.3221		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6090	44.10mm	46.70 mm
To Suit 13 – 16 g	17.6091	46.10 mm	48.70 mm
To Suit 18 – 24 g	17.6092	48.10 mm	50.70 mm

Tube Pulling Consumables Suitable for the Stub Pulling Ram

Consumables to Suit 15.88mm / 5/8" OD			
Draw Mandrel	CP-10S-03-58	ID Size Range	
Gripper Sets		From	To
To Suit 16 – 17 g	CP-1000-01-58-16	12.85 mm	13.85 mm
To Suit 18 – 19 g	CP-1000-01-58-18	13.60 mm	14.60 mm
To Suit 20 – 21 g	CP-1000-01-58-20	14.30 mm	15.30 mm
To Suit 22 – 23 g	CP-1000-01-58-22	14.60 mm	15.65 mm
Consumables to Suit 19.05mm / 3/4" OD			
Draw Mandrel	CP-10S-03-34	ID Size Range	
Gripper Sets		From	To
To Suit 16 – 17 g	CP-1000-01-34-16	16.05 mm	17.05 mm
To Suit 18 – 19 g	CP-1000-01-34-18	16.90 mm	17.90 mm
To Suit 20 – 21 g	CP-1000-01-34-20	17.60 mm	18.60 mm
To Suit 22 – 23 g	CP-1000-01-34-22	17.95 mm	18.95 mm
Consumables to Suit 22.23mm / 7/8" OD			
Draw Mandrel	CP-10S-03-78	ID Size Range	
Gripper Sets		From	To
To Suit 16 – 17 g	CP-1000-01-78-16	19.20 mm	20.20 mm
To Suit 18 – 19 g	CP-1000-01-78-18	20.00 mm	21.00 mm
To Suit 20 – 21 g	CP-1000-01-78-20	20.70 mm	21.70 mm
To Suit 22 – 23 g	CP-1000-01-78-22	21.05 mm	22.05 mm
Consumables to Suit 25.40mm / 1" OD			
Draw Mandrel	CP-10S-03-1	ID Size Range	
Gripper Sets		From	To
To Suit 16 – 17 g	CP-1000-01-1-16	22.40 mm	23.40 mm
To Suit 18 – 19 g	CP-1000-01-1-18	23.20 mm	24.20 mm
To Suit 20 – 21 g	CP-1000-01-1-20	23.90 mm	24.90 mm
To Suit 22 – 23 g	CP-1000-01-1-22	24.70 mm	25.70 mm
Consumables to Suit 31.75mm / 1 1/4" OD			
Draw Mandrel	CP-10S-114-58	ID Size Range	
Gripper Sets		From	To
To Suit 16 – 17 g	CP-1000-01-114-16	28.80 mm	29.80 mm
To Suit 18 – 19 g	CP-1000-01-114-18	29.60 mm	30.60 mm
To Suit 20 – 21 g	CP-1000-01-114-20	30.35 mm	31.35 mm
To Suit 22 – 23 g	CP-1000-01-114-22	30.70 mm	31.70 mm
Consumables to Suit 38.10mm / 1 1/2" OD			
Draw Mandrel	CP-10S-112-58	ID Size Range	
Gripper Sets		From	To
To Suit 16 – 17 g	CP-1000-01-112-16	35.20 mm	36.20 mm
To Suit 18 – 19 g	CP-1000-01-112-18	36.00 mm	37.00 mm
To Suit 20 – 21 g	CP-1000-01-112-20	36.70 mm	37.70 mm
To Suit 22 – 23 g	CP-1000-01-112-22	37.05 mm	38.05 mm

TRIDENT V3

TUBE PULLING MACHINE



The TRIDENT Automatic Tube Puller is a swift, reliable solution for the removal of even the most stubborn tubes from Heat Exchangers, Condensers and Boilers.

Using our tried and tested extraction system, tubes can be continuously pulled from between 12.5mm OD. (½") and 76mm OD. (3")** at up to 5 m/Min*, a choice of 15, 30 & 45 Ton pulling ram options are available.

One of the most significant upgrades in the latest Version 3 machine is the elimination of the ram switching system, previously a potential source of downtime. The mechanical switching rods replaced by a more reliable hydraulic switching system, now fully integrated into the power pack.

The V3 continues to offer user-friendly controls, including manual pull and return, which allow for precise jogging of the ram.

We offer a 380 – 415Volt 3 Phase Electric Powerpack for workshop and low hazard areas, or Fully Pneumatic 6.5HP Powerpack, designed especially for use in hazardous environments.

TRIDENT V3 is the latest, essential equipment for fast turn around jobs where time is money and reliability is essential.



*Achieved with the 15Ton Pulling Ram **Achieved with the 45Ton Pulling Ram

Power options	Details
Electric	380 - 415V 3 phase
Pneumatic	6 Bar, 120 cfm (6.5hp)

Pulling ram	Tube extraction range
15 Ton	12.5mm – 25mm (½" – 1") OD
30 Ton	12.5mm – 38mm (½" – 1 ½") OD
45 Ton	38mm – 76mm (1 ½" – 3") OD



15 Ton pulling ram	
Min Tube Size OD	12.5mm (½")
Max Tube Size OD	25mm (1")
Free Pull Speed	5 M/Min
Max Pull Force	15,000 Kg
Weight	26 Kg (57lbs)
Pulling Stroke	125mm (5")



30 Ton pulling ram	
Min Tube Size OD	12.5mm (½")
Max Tube Size OD	38mm (1 ½")
Free Pull Speed	3 M/Min
Max Pull Force	30,000 Kg
Weight	52 Kg (114lbs)
Pulling Stroke	150mm (6")



45 Ton pulling ram	
Min Tube Size OD	38mm (1 ½")
Max Tube Size OD	76mm (3")
Free Pull Speed	1.5 M/Min
Max Pull Force	45,000 Kg
Weight	67 Kg (145lbs)
Pulling Stroke	75mm (3")



Power pack details		
Dimensions	980 x 740 x 1150mm	
Operating Pressure	High speed: 80 Bar @ 28 l/min	
	High Pressure: 300 Bar @ 8 l/min	
Electric		
Power	4 Kw - 5.5hp	
Voltage	380-415 Volt 3 Phase	
Pneumatic		
Power	5.5 Kw - 7.0hp	
Air requirements	3400 l/min	120cfm
	6 bar	90 Psi

Tube Pulling Consumables Suitable for the 15 Ton (not above 1") & 30 Ton Ram

Consumables to Suit 12.7mm / 1/2" OD			
Collar	17.0500	ID Size Range	
Pull Jaw 15 Ton	17.3021		
Hold Jaw 15 Ton	17.3022		
Pull Jaw 30 Ton	17.3020		
Hold Jaw 30 Ton	17.3022		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6000	5.50mm	8.10mm
To Suit 13 – 16 g	17.6001	7.60mm	10.20mm
To Suit 18 – 24 g	17.6002	10.10mm	11.60mm
Consumables to Suit 15.88mm / 5/8" OD			
Collar	17.0625	ID Size Range	
Pull Jaw 15 Ton	17.3031		
Hold Jaw 15 Ton	17.3032		
Pull Jaw 30 Ton	17.3030		
Hold Jaw 30 Ton	17.3032		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6010	8.50mm	11.00mm
To Suit 13 – 16 g	17.6011	11.00mm	13.60mm
To Suit 18 – 24 g	17.6012	13.05mm	15.65mm
Consumables to Suit 19.05mm / 3/4" OD			
Collar	17.0750	ID Size Range	
Pull Jaw 15 Ton	17.3041		
Hold Jaw 15 Ton	17.3042		
Pull Jaw 30 Ton	17.3040		
Hold Jaw 30 Ton	17.3042		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6020	12.20mm	14.80 mm
To Suit 13 – 16 g	17.6021	14.10 mm	16.70 mm
To Suit 18 – 24 g	17.6022	16.25 mm	18.85 mm
Consumables to Suit 22.23mm / 7/8" OD			
Collar	17.0875	ID Size Range	
Pull Jaw 15 Ton	17.3046		
Hold Jaw 15 Ton	17.3047		
Pull Jaw 30 Ton	17.3045		
Hold Jaw 30 Ton	17.3047		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6030	15.35 mm	17.95 mm
To Suit 13 – 16 g	17.6031	17.35 mm	19.95 mm
To Suit 18 – 24 g	17.6032	19.50 mm	22.10 mm

Tube Pulling Consumables Suitable for the 15 & 30 Ton Ram

Consumables to Suit 25.4mm / 1" OD			
Collar	17.1000	ID Size Range	
Pull Jaw 15 Ton	17.3051		
Hold Jaw 15 Ton	17.3052		
Pull Jaw 30 Ton	17.3050		
Hold Jaw 30 Ton	17.3052		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6040	18.50 mm	21.10 mm
To Suit 13 – 16 g	17.6041	20.50 mm	23.10 mm
To Suit 18 – 24 g	17.6042	22.60 mm	25.20 mm
Consumables to Suit 28.58mm / 1 1/8" OD			
Collar	17.1125	ID Size Range	
Pull Jaw	17.3060		
Hold Jaw	17.3062		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6050	21.80 mm	24.40 mm
To Suit 13 – 16 g	17.6051	23.80 mm	26.40 mm
To Suit 18 – 24 g	17.6052	25.80 mm	28.40 mm
Consumables to Suit 31.75mm / 1 1/4" OD			
Collar	17.1250	ID Size Range	
Pull Jaw	17.3070		
Hold Jaw	17.3072		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6060	24.90 mm	27.50 mm
To Suit 13 – 16 g	17.6061	26.90 mm	29.50 mm
To Suit 18 – 24 g	17.6062	28.95 mm	31.55 mm
Consumables to Suit 38.1 / 1 1/2" OD			
Collar	17.1500	ID Size Range	
Pull Jaw	17.3090		
Hold Jaw	17.3092		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6070	31.30 mm	33.90 mm
To Suit 13 – 16 g	17.6071	33.30 mm	35.90 mm
To Suit 18 – 24 g	17.6072	35.30 mm	37.90 mm

Tube Pulling Consumables Suitable for the 45 Ton Ram

Consumables to Suit 38.10mm / 1 1/2" OD			
Collar	17.3212	ID Size Range	
Pull Jaw	17.3210		
Hold Jaw	17.3211		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6070	31.30 mm	33.90 mm
To Suit 13 – 16 g	17.6071	33.30 mm	35.90 mm
To Suit 18 – 24 g	17.6072	35.30 mm	37.90 mm
Consumables to Suit 44.45mm / 1 3/4" OD			
Collar	17.3217	ID Size Range	
Pull Jaw	17.3215		
Hold Jaw	17.3216		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6080	37.70 mm	40.30 mm
To Suit 13 – 16 g	17.6081	39.70 mm	42.30 mm
To Suit 18 – 24 g	17.6082	41.70 mm	44.30 mm
Consumables to Suit 50.80mm / 2" OD			
Collar	17.3222	ID Size Range	
Pull Jaw	17.3220		
Hold Jaw	17.3221		
Mandrel Options		From	To
To Suit 10 – 12 g	17.6090	44.10 mm	46.70 mm
To Suit 13 – 16 g	17.6091	46.10 mm	48.70 mm
To Suit 18 – 24 g	17.6092	48.10 mm	50.70 mm
Consumables to Suit 57.15mm / 2 1/4" OD			
Collar	17.3232	ID Size Range	
Pull Jaw	17.3230		
Hold Jaw	17.3231		
Mandrel Options		From	To
To Suit 10 – 12 g	17.7000	50.38 mm	52.48 mm
To Suit 13 – 16 g	17.7001	52.38 mm	54.48 mm
To Suit 18 – 24 g	17.7002	54.38 mm	56.58 mm
Consumables to Suit 63.5mm / 2 1/2" OD			
Collar	17.3242	ID Size Range	
Pull Jaw	17.3240		
Hold Jaw	17.3241		
Mandrel Options		From	To
To Suit 10 – 12 g	17.7010	56.73 mm	58.83 mm
To Suit 13 – 16 g	17.7011	58.73 mm	60.83 mm
To Suit 18 – 24 g	17.7012	60.73 mm	62.93 mm

MANUAL TUBE PULLER

KSP



The KSP has been designed to make tube removal easy and economical when carrying out small quantity or hard to reach tube pulls.

- ▶ Simply insert the spear into the tube and thread it in with a handwrench until it has enough grip to extract the tube.
- ▶ Use another hand wrench on the black hex at the rear and this will press the front collar up against the tube sheet and allow the spear to pull the tube out.
- ▶ No external power is required.
- ▶ Durable - All parts made out of high strength steel and are heat treated.

TUBE OD	TUBE GAUGE	WALL THKS.		TUBE I.D.		TUBE PULLER NO.	SPARE SPEAR NO.
	[BWG]	[inch]	[mm]	[inch]	[mm]		
1/2"	14	0,08	2,11	0,334	8,48	KSP 500-14	KSP 1/2-14
	16	0,07	1,65	0,370	9,40	KSP500-16	KSP 1/2-16
	18	0,05	1,24	0,402	10,21	KSP 500-18	KSP 1/2-18
	20	0,04	0,89	0,430	10,92	KSP 500-20	KSP 1/2-20
5/8"	14	0,08	2,11	0,459	11,66	KSP 625-14	KSP 5/8-14
	16	0,07	1,65	0,495	12,57	KSP 625-16	KSP 5/8-16
	18	0,05	1,24	0,527	13,39	KSP 625-18	KSP 5/8-18
	20	0,04	0,89	0,555	14,10	KSP 625-20	KSP 5/8-20
3/4"	14	0,08	2,11	0,585	14,86	KSP 750-14	KSP 3/4-14
	16	0,07	1,65	0,620	15,75	KSP 750-16	KSP 3/4-16
	18	0,05	1,24	0,652	16,56	KSP 750-18	KSP 3/4-18
	20	0,04	0,89	0,680	17,27	KSP 750-20	KSP 3/4-20
7/8"	14	0,08	2,11	0,709	18,01	KSP 875-14	KSP 7/8-14
	16	0,07	1,65	0,745	18,92	KSP 875-16	KSP 7/8-16
	18	0,05	1,24	0,777	19,74	KSP 875-18	KSP 7/8-18
	20	0,04	0,89	0,805	20,45	KSP 875-20	KSP 7/8-20
1"	14	0,08	2,11	0,834	21,18	KSP 1000-14	KSP 1-14
	16	0,07	1,65	0,870	22,10	KSP 1000-16	KSP 1-16
	18	0,05	1,24	0,902	22,91	KSP 1000-18	KSP 1-18
	20	0,04	0,89	0,930	23,62	KSP 1000-20	KSP 1-20

INTERNAL TUBE CUTTERS

PUSH TYPE TUBE CUTTER



- ▶ The Push Type Cutter can be driven with a Pneumatic or Electric drill motor.
- ▶ The tool uses spring-loaded cutters, which are adjustable for depth and cut when pressure is applied during use.
- ▶ Two cutter tips as standard on tube sizes from 1”.
- ▶ The tool has a 6” cutting reach as standard (other lengths available on request).
- ▶ Tools listed are 'universal' tools and cover a range of thicknesses with interchangeable pilots.
- ▶ Solid body tools, covering a specific tube size, are also available from size 3/8” up (please enquire).

TUBE SIZE (OD.)			PART NUMBER	
mm	INCH	PILOT RANGE	COMPLETE TOOL	CUTTER BIT
15.8	5/8”	16-22g	42.PC-158	42.PCB25186
19.0	3/4”	14-22g	42.PC-190	42.PCB25186
22.2	7/8”	11-22g	42.PC-222	42.PCB25194
25.4	1”	11-13g	42.PC-222	42.PCB25194
Twin Blade Cutters ▼				
25.4	1”	14-22g	42.PC-254	42.PCB25199
31.7	1 ¼”	14-22g	42.PC-317	42.PCB25206
38.1	1 ½”	10-20g	42.PC-381	42.PCB25206
50.8	2”	6-16g	42.PC-508	42.PCB25221
63.5	2 ½”	8-12g	42.PC-635	42.PCB25223



INTERNAL TUBE CUTTERS

ONE REVOLUTION CUTTER



- ▶ The One Revolution type cutter is suitable for cutting steel and non-ferrous tubes used in condensers, heat exchangers and boilers.
- ▶ The tool is adjustable to tube sheet thickness from 2" to 6" (50.8mm – 152.4mm), extended tools are available on request.
- ▶ The tool is designed for hand operation using either a ratchet or hand wrench. It is not suitable for use with a power tool.
- ▶ The tool operates by turning the tool clockwise, this brings the cutter tip into contact with the inside of the tube, the tip punctures the tube and locks in position to cut through the tube as it turns.

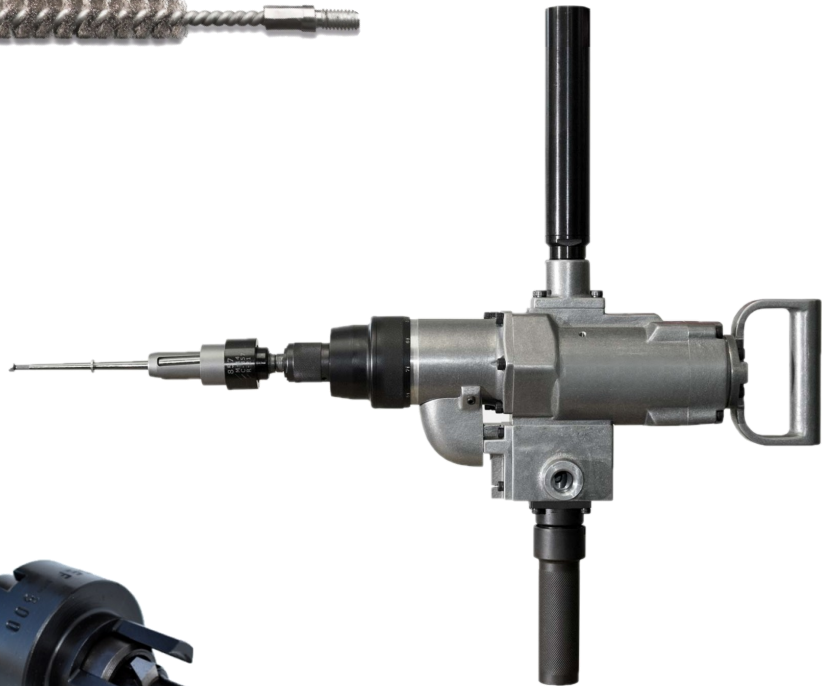
Tube OD.	Tube Gauge	Tube ID Range	Tool Number	Cutter Bit
12.7 mm	1/2"	18 - 19 g	ORTC - 100	N - 625 - 4
12.7 mm	1/2"	20 g	ORTC - 108	N - 625 - 4
15.8 mm	5/8"	14 g	ORTC - 113	N - 625 - 3
15.8 mm	5/8"	15 - 16 g	ORTC - 119	N - 625 - 3
15.8 mm	5/8"	17 - 18 g	ORTC - 123	N - 625 - 2
15.8 mm	5/8"	19 - 20 g	ORTC - 131	N - 625 - 2
15.8 mm	5/8"	22 g	ORTC - 139	N - 750 - 2
19 mm	3/4"	14 - 15 g	ORTC - 145	N - 750 - 2
19 mm	3/4"	16 g	ORTC - 151	N - 750 - 2
19 mm	3/4"	17 - 18 g	ORTC - 153	N - 750 - 2
19 mm	3/4"	19 - 20 g	ORTC - 163	N - 1000 - 1
22.2 mm	7/8"	14 - 15 g	ORTC - 174	N - 1000 - 1
22.2 mm	7/8"	16 - 17 g	ORTC - 184	N - 1000 - 1
22.2 mm	7/8"	18 g	ORTC - 190	N - 1000 - 1
22.2 mm	7/8"	19 - 20 g	ORTC - 193	N - 1000 - 2
25.4 mm	1"	12 g	ORTC - 193	N - 1000 - 2
25.4 mm	1"	14 g	ORTC - 205	N - 1000 - 2
25.4 mm	1"	15 g	ORTC - 210	N - 1000 - 2
25.4 mm	1"	16 - 17 g	ORTC - 215	N - 1000 - 2
25.4 mm	1"	18 - 20 g	ORTC - 223	N - 1000 - 2
25.4 mm	1"	22 g	ORTC - 232	N - 1000 - 2

Tube OD.		Tube Gauge	Tube ID Cover	Tool Number	Cutter Bit
31.75 mm	1 ¼"	10 - 11 g	24.9 – 25.6 mm	ORTC – 245	N – 1000 – 2
31.75 mm	1 ¼"	12 g	25.9 – 26.7 mm	ORTC – 255	N – 1000 – 2
31.75 mm	1 ¼"	13 - 14 g	26.7 – 27.4 mm	ORTC – 264	N – 1000 – 2
31.75 mm	1 ¼"	15 - 16 g	27.9 – 28.7 mm	ORTC – 274	N – 1000 – 2
31.75 mm	1 ¼"	17 - 19 g	28.7 – 29.6 mm	ORTC – 283	N – 1000 – 2
38.1 mm	1 ½"	10 – 11 g	31.3 – 32.1 mm	ORTC – 309	N – 1500 – 1
38.1 mm	1 ½"	12 - 13 g	32.5 – 33.3 mm	ORTC – 320	N – 1500 – 1
38.1 mm	1 ½"	14 - 15 g	33.8 – 34.5 mm	ORTC – 333	N – 1500 – 1
38.1 mm	1 ½"	16 - 17 g	34.5 – 35.3 mm	ORTC – 339	N – 1500 – 1
38.1 mm	1 ½"	18 - 19 g	35.3 – 36.1mm	ORTC – 350	N – 1500 – 1
44.45 mm	1 ¾"	10 - 11 g	37.0 – 38.5 mm	ORTC – 369	N – 1500 – 1
44.45 mm	1 ¾"	12 - 14 g	38.8 – 40.3 mm	ORTC – 383	N – 1500 – 1
44.45 mm	1 ¾"	15 - 16 g	40.8 – 41.2 mm	ORTC – 403	N – 1500 – 1
44.45 mm	1 ¾"	17 - 18 g	41.3 – 42.0 mm	ORTC – 410	N – 1500 – 1
50.8 mm	2"	10 g	44.0 mm	ORTC – 435	N – 1500 – 1
50.8 mm	2"	11 g	51.0 mm	ORTC – 442	N – 1500 – 1
50.8 mm	2"	12 – 13 g	45.0 – 46.0 mm	ORTC – 447	N – 1500 – 1
50.8 mm	2"	14 - 15 g	46.2 – 48.2 mm	ORTC – 457	N – 1500 – 1
50.8 mm	2"	16 – 17 g	47.2 – 48.2 mm	ORTC – 468	N – 1500 – 1
50.8 mm	2"	18 – 19 g	48.0 – 49.0 mm	ORTC – 476	N – 1500 – 1
57.15 mm	2 ¼"	10 g	50.3 mm	ORTC – 497	N – 2250 – 1
57.15 mm	2 ¼"	11 g	51.0 mm	ORTC – 505	N – 2250 – 1
57.15 mm	2 ¼"	12 - 13 g	51.6 – 52.3 mm	ORTC – 511	N – 2250 – 1
57.15 mm	2 ¼"	14 - 15 g	52.9 – 53.5 mm	ORTC – 524	N – 2250 – 1
57.15 mm	2 ¼"	16 - 17 g	53.8 – 54.8 mm	ORTC – 533	N – 2250 – 1
57.15 mm	2 ¼"	18 - 19 g	54.6 – 55.6 mm	ORTC – 541	N – 2250 – 1
63.5 mm	2 ½"	10 g	56.7 mm	ORTC – 562	N – 2250 – 1
63.5 mm	2 ½"	11 g	57.4 mm	ORTC – 569	N – 2250 – 1
63.5 mm	2 ½"	12 - 13 g	57.6 – 58.6 mm	ORTC – 572	N – 2250 – 1
63.5 mm	2 ½"	14 - 15 g	58.9 – 60.0 mm	ORTC – 585	N – 2250 – 1
63.5 mm	2 ½"	16 - 17 g	60.0 – 61.0 mm	ORTC – 588	N – 2250 – 1
63.5 mm	2 ½"	18 - 19 g	60.7 – 61.7 mm	ORTC – 602	N – 2250 – 1

Multiple horizontal blue lines for taking notes.

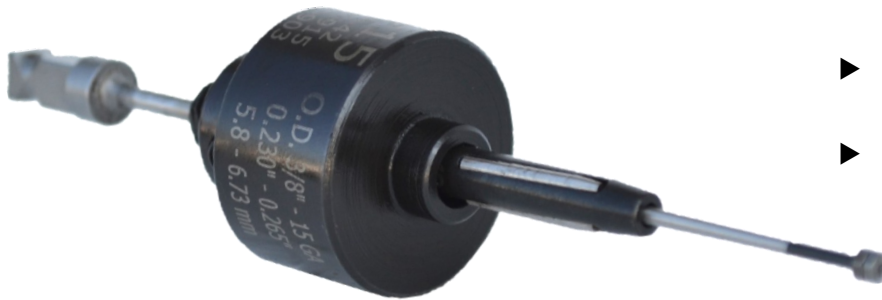


TUBE INSTALLATION



TUBE EXPANDERS

900 SERIES



- ▶ Product range covers tube sizes from **6.35mm** (1/4") OD. **Up to 9.53mm** (3/8") OD.
- ▶ Available with 19mm (3/4") or 32mm (1 1/4") roll lengths for tube sheet thickness from

TUBE GAUGE		TUBE I. D.		MIN. EXPANSION		MAX. EXPANSION		TUBE SHEET THICKNESS				MANDREL		MANDREL SQUARE	
								1/2" to 1-1/2"		1-1/4" to 2-1/4"					
								12,7 to 38,1 mm		31,7 to 57,1mm					
[bwg]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Tool No.	Roll No.	Tool No.	Roll No.		[inch]	
1/4"	18	0,049	1,24	0,152	3,86	0,151	3,84	0,173	4,39	TR921	TRR921	-	-	TRM-39	1/4"
	19	0,042	1,07	0,166	4,22	0,165	4,19	0,185	4,70	TR922	TRR923	-	-	TRM-39	1/4"
	20	0,035	0,89	0,180	4,57	0,175	4,45	0,200	5,08	TR923	TRR923	-	-	TRM-40	1/4"
6.35 mm	21	0,072	1,83	0,186	4,72	0,180	4,57	0,207	5,26	TR924	TRR924	-	-	TRM-40	1/4"
	22	0,028	0,71	0,194	4,93	0,190	4,83	0,216	5,49	TR925	TRR925	-	-	TRM-41	1/4"
	23	0,025	0,64	0,200	5,08	0,195	4,95	0,222	5,64	TR926	TRR923	-	-	TRM-41	1/4"
3/8"	24	0,022	0,56	0,206	5,23	0,201	5,11	0,230	5,84	TR927	TRR924	-	-	TRM-41	1/4"
	14	0,022	0,56	0,206	5,23	0,201	5,11	0,230	5,84	TR927	TRR924	-	-	TRM-41	1/4"
	15	0,072	1,83	0,231	5,87	0,230	5,84	0,265	6,73	TR915	TRR903	-	-	TRM-42	1/4"
9.53 mm	16	0,065	1,65	0,245	6,22	0,240	6,10	0,275	6,99	TR916	TRR916	TR916L	TR916L	TRM-36	1/4"
	17	0,058	1,47	0,259	6,58	0,255	6,48	0,289	7,34	TR918	TRR903	TR920	TR904	TRM-38	1/4"
	18	0,049	1,24	0,277	7,04	0,272	6,91	0,307	7,80	TR901	TRR903	TR902	TR904	TRM-30	1/4"
1"	19	0,042	1,07	0,291	7,39	0,286	7,26	0,320	8,13	TR903	TRR903	TR904	TR904	TRM-31	1/4"
	20	0,035	0,89	0,305	7,75	0,300	7,62	0,334	8,48	TR905	TRR907	TR906	TR908	TRM-32	1/4"
	21	0,032	0,81	0,311	7,90	0,306	7,77	0,340	8,64	TR907	TRR907	TR908	TR908	TRM-33	1/4"
	22	0,028	0,71	0,319	8,10	0,314	7,98	0,349	8,86	TR909	TRR909	TR910	TR910	TRM-34	1/4"
1 1/4"	23	0,025	0,64	0,325	8,26	0,320	8,13	0,357	9,07	TR911	TRR911	TR912	TR912	TRM-34	1/4"
	24	0,022	0,56	0,331	8,41	0,319	8,10	0,357	9,07	TR911	TRR911	TR912	TR912	TRM-34	1/4"

See our selection of Roll Motors to suit the 900 series Tube Expanders



TES-Mini 2 Electric



K20 Pneumatic



TUBE EXPANDERS

1300 SERIES



- ▶ Product range covers tube sizes for **9.53mm (3/8")** OD tubes
- ▶ Available with **19mm (3/4")** or **32mm (1 1/4")** Roll lengths for tube sheet thickness from **3.18mm (1/8")** to **84.9mm (3.35")**

TUBE GAUGE	TUBE I. D.									TUBE SHEET THICKNESS				MANDREL SQUARE		
										1/2" to 1-1/2"		1-1/4" to 2-1/4"			MANDREL	SQUARE
										12,7 to 38,1 mm		31,7 to 57,1mm				
[bwg]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Tool No.	Roll No.	Tool No.	Roll No.				
3/8"	15	0,072	1,83	0,231	5,87	0,230	5,84	0,265	6,73	TR-1315	TRR-1315	TR-1316	TRR-1316	TRM-86	1/4"	
	16	0,065	1,65	0,245	6,22	0,240	6,10	0,275	6,99	TR-1319	TRR-1315	TR-1319L	TRR1319L	TRM-86	1/4"	
	17	0,058	1,47	0,259	6,58	0,255	6,48	0,289	7,34	TR-1317	TRR-903	TR-1318	TRR-904	TRM-88	1/4"	
	18	0,049	1,24	0,277	7,04	0,272	6,91	0,307	7,80	TR-1301	TRR-903	TR-1302	TRR-904	TRM-80	1/4"	
9.53 mm	19	0,042	1,07	0,291	7,39	0,286	7,26	0,320	8,13	TR-1303	TRR-903	TR-1304	TRR-904	TRM-81	1/4"	
	20	0,035	0,89	0,305	7,75	0,300	7,62	0,334	8,48	TR-1305	TRR-907	TR-1306	TRR-908	TRM-82	1/4"	
	21	0,032	0,81	0,311	7,90	0,306	7,77	0,340	8,64	TR-1307	TRR-907	TR-1308	TRR-908	TRM-83	1/4"	
	22	0,028	0,71	0,319	8,10	0,314	7,98	0,349	8,86	TR-1309	TRR-909	TR-1310	TRR-910	TRM-84	1/4"	
	23	0,025	0,64	0,325	8,26	0,320	8,13	0,357	9,07	TR-1311	TRR-911	TR-1312	TRR-912	TRM-84	1/4"	
	24	0,022	0,56	0,331	8,41	0,319	8,10	0,357	9,07	TR-1311	TRR-911	TR-1312	TRR-912	TRM-84	1/4"	

See our selection of Roll Motors to suit the 1300 series Tube Expanders



TES-Mini 2 Electric



K20 Pneumatic



TUBE EXPANDERS

800 SERIES



- ▶ Product range covers tube sizes from **12.7mm (1/2") OD. to 38.1mm (1 1/2") OD.**
- ▶ Available with **38.1mm (1 1/2") or 57.1mm (2 1/4") rollers.**
- ▶ For tube sheet thickness from **12.7mm (1/2") to 57.1mm (2 1/4").**
- ▶ Each expander features a reversible collar, flush one side, recessed by 3.2mm (1/8") on the reverse side.
- ▶ Totally interchangeable with Airetool, Wicksteed and Teco 800 expanders. 5 roll expanders also available on request.

	TUBE GAUGE		TUBE I. D.		MIN. EXPANSION		MAX. EXPANSION		TUBE SHEET THICKNESS				MANDREL	MANDREL SQUARE				
									1/2" to 1-1/2"		1-1/4" to 2-1/4"				Tool No.	Roll No.	Tool No.	Roll No.
									12,7 to 38,1 mm		31,7 to 57,1mm							
	[bwg]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Tool No.	Roll No.	Tool No.	Roll No.	[inch]				
1/2"	14	0,083	2,11	0,334	8,48	0,324	8,23	0,374	9,50	TR797	TR797	-	-	TR797	3/8"			
	15	0,072	1,83	0,356	9,04	0,348	8,84	0,398	10,11	TR799	TRR-1	-	-	TR799	3/8"			
12,7mm	16	0,065	1,65	0,370	9,40	0,36	9,14	0,410	10,41	TR801	TRR-1	-	-	TRM-1	3/8"			
	17	0,058	1,47	0,384	9,75	0,374	9,50	0,424	10,77	TR803	TRR-2	-	-	TRM-1	3/8"			
	18	0,049	1,24	0,402	10,21	0,392	9,96	0,447	11,35	TR805	TRR-3	-	-	TRM-2	3/8"			
5/8"	12	0,109	2,77	0,407	10,34	0,392	9,96	0,447	11,35	TR805	TRR-3	-	-	TRM-2	3/8"			
	13	0,095	2,41	0,435	11,05	0,425	10,80	0,480	12,19	TR807	TRR-4	-	-	TRM-3	3/8"			
	14	0,083	2,11	0,459	11,66	0,449	11,40	0,509	12,93	TR809	TRR-4	TR810	TRR-4-A	TRM-4	3/8"			
	15	0,072	1,83	0,481	12,22	0,471	11,96	0,536	13,61	TR811	TRR-5	TR812	TRR-5-A	TRM-5	3/8"			
	16	0,065	1,65	0,495	12,57	0,485	12,32	0,550	13,97	TR813	TRR-6	TR814	TRR-6-A	TRM-5	3/8"			
	17	0,058	1,47	0,509	12,93	0,499	12,67	0,564	14,33	TR815	TRR-6	TR816	TRR-6-A	TRM-6	3/8"			
	18	0,049	1,24	0,527	13,39	0,517	13,13	0,572	14,53	TR817	TRR-7	TR818	TRR-7-A	TRM-7	3/8"			
	19	0,042	1,07	0,541	13,74	0,522	13,26	0,582	14,78	TR819	TRR-7	TR820	TRR-7-A	TRM-6	3/8"			
	20	0,035	0,89	0,555	14,10	0,536	13,61	0,596	15,14	TR819	TRR-7	TR820	TRR-7-A	TRM-8	3/8"			
	21	0,032	0,81	0,561	14,25	0,536	13,61	0,596	15,14	TR819	TRR-7	TR820	TRR-7-A	TRM-8	3/8"			
15,8mm	22	0,028	0,71	0,569	14,45	0,536	13,61	0,596	15,14	TR819	TRR-7	TR820	TRR-7-A	TRM-8	3/8"			
	10	0,134	3,40	0,482	12,24	0,471	11,96	0,536	13,61	TR811	TRR-5	TR812	TRR-5-A	TRM-5	3/8"			
	11	0,120	3,05	0,510	12,95	0,499	12,67	0,564	14,33	TR815	TRR-6	TR816	TRR-6-A	TRM-6	3/8"			
	12	0,109	2,77	0,532	13,51	0,522	13,26	0,582	14,78	TR819	TRR-7	TR820	TRR-7-A	TRM-6	3/8"			
	13	0,095	2,41	0,560	14,22	0,550	13,97	0,615	15,62	TR821	TRR-8	TR822	TRR-8-A	TRM-8	3/8"			
	14	0,083	2,11	0,584	14,83	0,574	14,58	0,639	16,23	TR823	TRR-9	TR824	TRR-9-A	TRM-8	3/8"			
	15	0,072	1,83	0,606	15,39	0,596	15,14	0,661	16,79	TR825	TRR-10	TR826	TRR-10-A	TRM-8	3/8"			
	16	0,065	1,65	0,620	15,75	0,605	15,37	0,685	17,40	TR827	TRR-10	TR828	TRR-10-A	TRM-9	3/8"			
	17	0,058	1,47	0,634	16,10	0,619	15,72	0,699	17,75	TR829	TRR-11	TR830	TRR-11-A	TRM-9	3/8"			
	18	0,049	1,24	0,652	16,56	0,619	15,72	0,699	17,75	TR829	TRR-11	TR830	TRR-11-A	TRM-9	3/8"			
3/4"	19	0,042	1,07	0,666	16,92	0,642	16,31	0,722	18,34	TR831	TRR-12	TR832	TRR-12-A	TRM-9	3/8"			
	20	0,035	0,89	0,680	17,27	0,642	16,31	0,722	18,34	TR831	TRR-12	TR832	TRR-12-A	TRM-9	3/8"			
	21	0,032	0,81	0,686	17,42	0,642	16,31	0,722	18,34	TR831	TRR-12	TR832	TRR-12-A	TRM-9	3/8"			
	22	0,028	0,71	0,694	17,63	0,642	16,31	0,722	18,34	TR831	TRR-12	TR832	TRR-12-A	TRM-9	3/8"			
	10	0,134	3,40	0,607	15,42	0,596	15,14	0,661	16,79	TR825	TRR-10	TR826	TRR-10-A	TRM-8	3/8"			
	11	0,120	3,05	0,635	16,13	0,619	15,72	0,699	17,75	TR829	TRR-11	TR830	TRR-11-A	TRM-9	3/8"			
	12	0,109	2,77	0,657	16,69	0,642	16,31	0,722	18,34	TR831	TRR-12	TR832	TRR-12-A	TRM-9	3/8"			
	13	0,095	2,41	0,685	17,40	0,670	17,02	0,750	19,05	TR833	TRR-13	TR834	TRR-13-A	TRM-10	3/8"			
	14	0,083	2,11	0,709	18,01	0,685	17,40	0,774	19,66	TR835	TRR-14	TR836	TRR-14-A	TRM-11	3/8"			
	15	0,072	1,83	0,731	18,57	0,712	18,08	0,801	20,35	TR837	TRR-15	TR838	TRR-15-A	TRM-11	3/8"			
7/8"	16	0,065	1,65	0,745	18,92	0,726	18,44	0,815	20,70	TR839	TRR-15	TR840	TRR-15-A	TRM-12	3/8"			
	17	0,058	1,47	0,759	19,28	0,740	18,80	0,829	21,06	TR843	TRR-16	TR844	TRR-16-A	TRM-12	3/8"			
	18	0,049	1,24	0,777	19,74	0,740	18,80	0,829	21,06	TR843	TRR-16	TR844	TRR-16-A	TRM-12	3/8"			



	TUBE GAUGE		TUBE I. D.		MIN. EXPANSION				MAX. EXPANSION				TUBE SHEET THICKNESS				MANDREL	MANDREL SQUARE
													1/2" to 1-1/2"		1-1/4" to 2-1/4"			
													12,7 to 38,1 mm		31,7 to 57,1mm			
	[bwg]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Tool No.	Roll No.	Tool No.	Roll No.		[inch]			
1" 25,4mm	8	0,165	4,19	0,670	17,02	0,655	16,64	0,735	18,67	TR841	TRR-13	TR842	TRR-13-A	TRM-9	3/8"			
	9	0,148	3,76	0,704	17,88	0,685	17,40	0,774	19,66	TR835	TRR-14	TR836	TRR-14-A	TRM-11	3/8"			
	10	0,134	3,40	0,732	18,59	0,712	18,08	0,801	20,35	TR837	TRR-15	TR838	TRR-15-A	TRM-11	3/8"			
	11	0,120	3,05	0,760	19,30	0,740	18,80	0,829	21,06	TR843	TRR-16	TR844	TRR-16-A	TRM-12	3/8"			
	12	0,109	2,77	0,782	19,86	0,763	19,38	0,852	21,64	TR845	TRR-17	TR846	TRR-17-A	TRM-12	3/8"			
	13	0,095	2,41	0,810	20,57	0,791	20,09	0,880	22,35	TR847	TRR-18	TR848	TRR-18-A	TRM-12	3/8"			
	14	0,083	2,11	0,834	21,18	0,810	20,57	0,909	23,09	TR849	TRR-18	TR850	TRR-18-A	TRM-13	3/8"			
	15	0,072	1,83	0,856	21,74	0,837	21,26	0,936	23,77	TR851	TRR-19	TR852	TRR-19-A	TRM-13	3/8"			
	16	0,065	1,65	0,870	22,10	0,837	21,26	0,936	23,77	TR851	TRR-19	TR852	TRR-19-A	TRM-13	3/8"			
	17	0,058	1,47	0,884	22,45	0,865	21,97	0,964	24,49	TR855	TRR-21	TR856	TRR-21-A	TRM-13	3/8"			
	18	0,049	1,24	0,902	22,91	0,865	21,97	0,964	24,49	TR855	TRR-21	TR856	TRR-21-A	TRM-13	3/8"			
	19	0,042	1,07	0,916	23,27	0,865	21,97	0,964	24,49	TR855	TRR-21	TR856	TRR-21-A	TRM-13	3/8"			
	20	0,035	0,89	0,930	23,62	0,865	21,97	0,964	24,49	TR855	TRR-21	TR856	TRR-21-A	TRM-13	3/8"			
	1-1/8" 28,5mm	8	0,165	4,19	0,795	20,19	0,776	19,71	0,875	22,23	TR853	TRR-20	TR854	TRR-20-A	TRM-13	3/8"		
		9	0,148	3,76	0,829	21,06	0,810	20,57	0,909	23,09	TR849	TRR-18	TR850	TRR-18-A	TRM-13	3/8"		
		10	0,134	3,40	0,857	21,77	0,837	21,26	0,936	23,77	TR851	TRR-19	TR852	TRR-19-A	TRM-13	3/8"		
		11	0,120	3,05	0,885	22,48	0,865	21,97	0,964	24,49	TR855	TRR-21	TR856	TRR-21-A	TRM-13	3/8"		
		12	0,109	2,77	0,907	23,04	0,883	22,43	0,982	24,94	TR857	TRR-21	TR858	TRR-21-A	TRM-14	1/2"		
		13	0,095	2,41	0,935	23,75	0,916	23,27	1,015	25,78	TR859	TRR-22	TR860	TRR-22-A	TRM-14	1/2"		
		14	0,083	2,11	0,959	24,36	0,935	23,75	1,044	26,52	TR861	TRR-23	TR862	TRR-23-A	TRM-15	1/2"		
15		0,072	1,83	0,981	24,92	0,962	24,43	1,071	27,20	TR863	TRR-24	TR864	TRR-24-A	TRM-15	1/2"			
16		0,065	1,65	0,995	25,27	0,962	24,43	1,071	27,20	TR863	TRR-24	TR864	TRR-24-A	TRM-15	1/2"			
17		0,058	1,47	1,009	25,63	0,990	25,15	1,099	27,91	TR867	TRR-26	TR868	TRR-26-A	TRM-16	1/2"			
18	0,049	1,24	1,027	26,09	0,990	25,15	1,099	27,91	TR867	TRR-26	TR868	TRR-26-A	TRM-16	1/2"				
1-1/4" 31,7mm	8	0,165	4,19	0,92	23,37	0,901	22,89	1,010	25,65	TR865	TRR-25	TR866	TRR-25-A	TRM-15	1/2"			
	9	0,148	3,76	0,954	24,23	0,935	23,75	1,044	26,52	TR861	TRR-23	TR862	TRR-23-A	TRM-15	1/2"			
	10	0,134	3,40	0,982	24,94	0,962	24,43	1,071	27,20	TR863	TRR-24	TR864	TRR-24-A	TRM-15	1/2"			
	11	0,120	3,05	1,010	25,65	0,990	25,15	1,099	27,91	TR867	TRR-26	TR868	TRR-26-A	TRM-16	1/2"			
	12	0,109	2,77	1,032	26,21	1,013	25,73	1,122	28,50	TR869	TRR-27	TR870	TRR-27-A	TRM-16	1/2"			
	13	0,095	2,41	1,060	26,92	1,041	26,44	1,150	29,21	TR871	TRR-28	TR872	TRR-28-A	TRM-17	1/2"			
	14	0,083	2,11	1,084	27,53	1,060	26,92	1,169	29,69	TR873	TRR-29	TR874	TRR-29-A	TRM-17	1/2"			
	15	0,072	1,83	1,106	28,09	1,087	27,61	1,196	30,38	TR875	TRR-30	TR876	TRR-30-A	TRM-17	1/2"			
	16	0,065	1,65	1,12	28,45	1,087	27,61	1,196	30,38	TR875	TRR-30	TR876	TRR-30-A	TRM-17	1/2"			
	17	0,058	1,47	1,134	28,80	1,115	28,32	1,224	31,09	TR879	TRR-30	TR880	TRR-30-A	TRM-18	1/2"			
18	0,049	1,24	1,152	29,26	1,115	28,32	1,224	31,09	TR879	TRR-30	TR880	TRR-30-A	TRM-18	1/2"				
1-3/8" 34,9mm	8	0,165	4,19	1,045	26,54	1,026	26,06	1,135	28,83	TR877	TRR-31	TR878	TRR-31-A	TRM-17	1/2"			
	9	0,148	3,76	1,079	27,41	1,060	26,92	1,169	29,69	TR873	TRR-29	TR874	TRR-29-A	TRM-17	1/2"			
	10	0,134	3,40	1,107	28,12	1,087	27,61	1,196	30,38	TR875	TRR-30	TR876	TRR-30-A	TRM-17	1/2"			
	11	0,120	3,05	1,135	28,83	1,115	28,32	1,224	31,09	TR879	TRR-30	TR880	TRR-30-A	TRM-18	1/2"			
	12	0,109	2,77	1,157	29,39	1,133	28,78	1,242	31,55	TR881	TRR-32	TR882	TRR-32-A	TRM-18	1/2"			
	13	0,095	2,41	1,185	30,10	1,160	29,46	1,275	32,39	TR883	TRR-33	TR884	TRR-33-A	TRM-19	1/2"			
	14	0,083	2,11	1,209	30,71	1,179	29,95	1,294	32,87	TR885	TRR-34	TR886	TRR-34-A	TRM-20	1/2"			
	15	0,072	1,83	1,231	31,27	1,206	30,63	1,321	33,55	TR887	TRR-35	TR888	TRR-35-A	TRM-20	1/2"			
1-1/2" 38,1mm	16	0,065	1,65	1,245	31,62	1,206	30,63	1,321	33,55	TR887	TRR-35	TR888	TRR-35-A	TRM-20	1/2"			
	8	0,165	4,19	1,170	29,72	1,145	29,08	1,260	32,00	TR889	TRR-34	TR890	TRR-34-A	TRM-19	1/2"			
	9	0,148	3,76	1,204	30,58	1,145	29,08	1,294	32,87	TR885	TRR-34	TR886	TRR-34-A	TRM-20	1/2"			
	10	0,134	3,40	1,232	31,29	1,206	30,63	1,321	33,55	TR887	TRR-35	TR888	TRR-35-A	TRM-20	1/2"			
	11	0,120	3,05	1,260	32,00	1,235	31,37	1,350	34,29	TR891	TRR-36	TR892	TRR-36-A	TRM-20	1/2"			
	12	0,109	2,77	1,282	32,56	1,257	31,93	1,372	34,85	TR893	TRR-37	TR894	TRR-37-A	TRM-20	1/2"			
	13	0,095	2,41	1,310	33,27	1,285	32,64	1,400	35,56	TR895	TRR-37	TR896	TRR-37-A	TRM-21	1/2"			
	14	0,083	2,11	1,334	33,88	1,285	32,64	1,400	35,56	TR895	TRR-37	TR896	TRR-37-A	TRM-21	1/2"			
	15	0,072	1,83	1,356	34,44	1,331	33,81	1,446	36,73	TR897	TRR-38	TR898	TRR-38-A	TRM-21	1/2"			
	16	0,065	1,65	1,370	34,80	1,331	33,81	1,446	36,73	TR897	TRR-38	TR898	TRR-38-A	TRM-21	1/2"			
	17	0,058	1,47	1,384	35,15	1,331	33,81	1,472	37,39	TR899	TRR-38	TR900	TRR-38-A	TRM-22	1/2"			
	18	0,049	1,24	1,402	35,61	1,331	33,81	1,472	37,39	TR899	TRR-38	TR900	TRR-38-A	TRM-22	1/2"			
19	0,042	1,07	1,416	35,97	1,331	33,81	1,472	37,39	TR899	TRR-38	TR900	TRR-38-A	TRM-22	1/2"				
20	0,035	0,89	1,430	36,32	1,331	33,81	1,472	37,39	TR899	TRR-38	TR900	TRR-38-A	TRM-22	1/2"				

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TUBE EXPANDERS

1200 SERIES



- ▶ Product range covers tube sizes from **12.7mm (1/2") OD. to 38.1mm (1 1/2") OD.**
- ▶ Available with **38.1mm (1 1/2") or 57.1mm (2 1/4") rollers.**
- ▶ For tube sheet thickness from **12.7mm (1/2") to 152.4mm (6").** Extended reach expanders are available.
- ▶ Each expander features a reversible collar, flush one side, recessed by 3.2mm (1/8") on the reverse side.
- ▶ Totally interchangeable with Airetool, Wicksteed and Teco 800 expanders. 5 roll expanders also available on request.

Rolls	Reach	Tube Sheet Thickness	
		(Inch)	(mm)
1-1/2"	STD	1-1/2" - 6"	38.1 - 152.4
	A	1-1/2" - 8"	38.1 - 203.2
	B	1-1/2" - 10"	38.1 - 254.0
38.1mm	C	1-1/2" - 12"	38.1 - 304.8
	STD	2-1/4" - 6-3/4"	57.1 - 171.4
	A	2-1/4" - 8-3/4"	57.1 - 222.2
2-1/4"	B	2-1/4" - 10-3/4"	57.1 - 273.0
	C	2-1/4" - 12-3/4"	57.1 - 323.8

	TUBE GAUGE		TUBE I. D.		MIN. EXPANSION		MAX. EXPANSION		TUBE SHEET THICKNESS				MANDREL	MANDREL SQUARE	
									1/2" to 6"		2-1/4" to 6-3/4"				
									38.1 to 152.4 mm		57,1 to 171,4 mm				
	[bwg]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Tool No.	Roll No.	Tool No.	Roll No.		[inch]
1/2"	14	0,083	2,11	0,334	8,48	0,324	8,23	0,374	9,50	TR1197	TR797	-	-	TR1197	3/8"
	15	0,072	1,83	0,356	9,04	0,348	8,84	0,398	10,11	TR1199	TRR-1	-	-	TR1199	3/8"
	16	0,065	1,65	0,370	9,40	0,36	9,14	0,41	10,41	TR1201	TRR-1	-	-	TRM-51	3/8"
12,7mm	17	0,058	1,47	0,384	9,75	0,374	9,50	0,424	10,77	TR1203	TRR-2	-	-	TRM-51	3/8"
	18	0,049	1,24	0,402	10,21	0,392	9,96	0,447	11,35	TR1205	TRR-3	-	-	TRM-52	3/8"
	12	0,109	2,77	0,407	10,34	0,392	9,96	0,447	11,35	TR1205	TRR-3	-	-	TRM-52	3/8"
5/8"	13	0,095	2,41	0,435	11,05	0,425	10,80	0,480	12,19	TR1207	TRR-4	-	-	TRM-53	3/8"
	14	0,083	2,11	0,459	11,66	0,449	11,40	0,509	12,93	TR1209	TRR-4	TR1210	TRR-4-A	TRM-54	3/8"
	15	0,072	1,83	0,481	12,22	0,471	11,96	0,536	13,61	TR1211	TRR-5	TR1212	TRR-5-A	TRM-55	3/8"
15,8mm	16	0,065	1,65	0,495	12,57	0,485	12,32	0,550	13,97	TR1213	TRR-6	TR1214	TRR-6-A	TRM-55	3/8"
	17	0,058	1,47	0,509	12,93	0,499	12,67	0,564	14,33	TR1215	TRR-6	TR1216	TRR-6-A	TRM-56	3/8"
	18	0,049	1,24	0,527	13,39	0,517	13,13	0,572	14,53	TR1217	TRR-7	TR1218	TRR-7-A	TRM-57	3/8"
3/4"	10	0,134	3,40	0,482	12,24	0,471	11,96	0,536	13,61	TR1211	TRR-5	TR1212	TRR-5-A	TRM-55	3/8"
	11	0,120	3,05	0,510	12,95	0,499	12,67	0,564	14,33	TR1215	TRR-6	TR1216	TRR-6-A	TRM-56	3/8"
	12	0,109	2,77	0,532	13,51	0,522	13,26	0,582	14,78	TR1219	TRR-7	TR1220	TRR-7-A	TRM-56	3/8"
19mm	13	0,095	2,41	0,560	14,22	0,55	13,97	0,615	15,62	TR1221	TRR-8	TR1222	TRR-8-A	TRM-58	3/8"
	14	0,083	2,11	0,584	14,83	0,574	14,58	0,639	16,23	TR1223	TRR-9	TR1224	TRR-9-A	TRM-58	3/8"
	15	0,072	1,83	0,606	15,39	0,596	15,14	0,661	16,79	TR1225	TRR-10	TR1226	TRR-10-A	TRM-58	3/8"
7/8"	16	0,065	1,65	0,620	15,75	0,605	15,37	0,685	17,40	TR1227	TRR-10	TR1228	TRR-10-A	TRM-59	3/8"
	17	0,058	1,47	0,634	16,10	0,619	15,72	0,699	17,75	TR1229	TRR-11	TR1230	TRR-11 -A	TRM-59	3/8"
	18	0,049	1,24	0,652	16,56	0,619	15,72	0,699	17,75	TR1229	TRR-11	TR1230	TRR-11 -A	TRM-59	3/8"
22,2mm	19	0,042	1,07	0,666	16,92	0,642	16,31	0,722	18,34	TR1231	TRR-12	TR1232	TRR-12-A	TRM-59	3/8"
	20	0,035	0,89	0,680	17,27	0,642	16,31	0,722	18,34	TR1231	TRR-12	TR1232	TRR-12-A	TRM-59	3/8"
	21	0,032	0,81	0,686	17,42	0,642	16,31	0,722	18,34	TR1231	TRR-12	TR1232	TRR-12-A	TRM-59	3/8"
22,2mm	22	0,028	0,71	0,694	17,63	0,642	16,31	0,722	18,34	TR1231	TRR-12	TR1232	TRR-12-A	TRM-59	3/8"
	10	0,134	3,40	0,607	15,42	0,596	15,14	0,661	16,79	TR1225	TRR-10	TR1226	TRR-10-A	TRM-58	3/8"
	11	0,120	3,05	0,635	16,13	0,619	15,72	0,699	17,75	TR1229	TRR-11	TR1230	TRR-11 -A	TRM-59	3/8"
22,2mm	12	0,109	2,77	0,657	16,69	0,642	16,31	0,722	18,34	TR1231	TRR-12	TR1232	TRR-12-A	TRM-59	3/8"
	13	0,095	2,41	0,685	17,40	0,67	17,02	0,750	19,05	TR1233	TRR-13	TR1234	TRR-13-A	TRM-60	3/8"
	14	0,083	2,11	0,709	18,01	0,685	17,40	0,774	19,66	TR1235	TRR-14	TR1236	TRR-14-A	TRM-61	3/8"
22,2mm	15	0,072	1,83	0,731	18,57	0,712	18,08	0,801	20,35	TR1237	TRR-15	TR1238	TRR-15-A	TRM-61	3/8"
	16	0,065	1,65	0,745	18,92	0,726	18,44	0,815	20,70	TR1239	TRR-15	TR1240	TRR-15-A	TRM-62	3/8"
	17	0,058	1,47	0,759	19,28	0,740	18,80	0,829	21,06	TR1243	TRR-16	TR1244	TRR-16-A	TRM-62	3/8"
18	0,049	1,24	0,777	19,74	0,740	18,80	0,829	21,06	TR1243	TRR-16	TR1244	TRR-16-A	TRM-62	3/8"	



1200 SERIES



	TUBE GAUGE		TUBE I. D.		MIN. EXPANSION MAX. EXPANSION				TUBE SHEET THICKNESS				MANDREL	MANDREL SQUARE		
									1/2" to 6"		2-1/4" to 6-3/4"					
									38.1 to 152.4 mm		57,1 to 171.4mm					
[bwg]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	Tool No.	Roll No.	Tool No.	Roll No.	[inch]			
1" 25,4mm	8	0,165	4,19	0,670	17,02	0,655	16,64	0,735	18,67	TR1241	TRR-13	TR1242	TRR-13-A	TRM-59	3/8"	
	9	0,148	3,76	0,704	17,88	0,685	17,40	0,774	19,66	TR1235	TRR-14	TR1236	TRR-14-A	TRM-61	3/8"	
	10	0,134	3,40	0,732	18,59	0,712	18,08	0,801	20,35	TR1237	TRR-15	TR1238	TRR-15-A	TRM-61	3/8"	
	11	0,120	3,05	0,760	19,30	0,740	18,80	0,829	21,06	TR1243	TRR-16	TR1244	TRR-16-A	TRM-62	3/8"	
	12	0,109	2,77	0,782	19,86	0,763	19,38	0,852	21,64	TR1245	TRR-17	TR1246	TRR-17-A	TRM-62	3/8"	
	13	0,095	2,41	0,810	20,57	0,791	20,09	0,880	22,35	TR1247	TRR-18	TR1248	TRR-18-A	TRM-62	3/8"	
	14	0,083	2,11	0,834	21,18	0,810	20,57	0,909	23,09	TR1249	TRR-18	TR1250	TRR-18-A	TRM-63	3/8"	
	15	0,072	1,83	0,856	21,74	0,837	21,26	0,936	23,77	TR1251	TRR-19	TR1252	TRR-19-A	TRM-63	3/8"	
	16	0,065	1,65	0,870	22,10	0,837	21,26	0,936	23,77	TR1251	TRR-19	TR1252	TRR-19-A	TRM-63	3/8"	
	17	0,058	1,47	0,884	22,45	0,865	21,97	0,964	24,49	TR1255	TRR-21	TR1256	TRR-21-A	TRM-63	3/8"	
	18	0,049	1,24	0,902	22,91	0,865	21,97	0,964	24,49	TR1255	TRR-21	TR1256	TRR-21-A	TRM-63	3/8"	
	19	0,042	1,07	0,916	23,27	0,865	21,97	0,964	24,49	TR1255	TRR-21	TR1256	TRR-21-A	TRM-63	3/8"	
	20	0,035	0,89	0,930	23,62	0,865	21,97	0,964	24,49	TR1255	TRR-21	TR1256	TRR-21-A	TRM-63	3/8"	
	1-1/8" 28,5mm	8	0,165	4,19	0,795	20,19	0,776	19,71	0,875	22,23	TR1253	TRR-20	TR1254	TRR-20-A	TRM-63	3/8"
		9	0,148	3,76	0,829	21,06	0,810	20,57	0,909	23,09	TR1249	TRR-18	TR1250	TRR-18-A	TRM-63	3/8"
		10	0,134	3,40	0,857	21,77	0,837	21,26	0,936	23,77	TR1251	TRR-19	TR1252	TRR-19-A	TRM-63	3/8"
		11	0,120	3,05	0,885	22,48	0,865	21,97	0,964	24,49	TR1255	TRR-21	TR1256	TRR-21-A	TRM-63	3/8"
		12	0,109	2,77	0,907	23,04	0,883	22,43	0,982	24,94	TR1257	TRR-21	TR1258	TRR-21-A	TRM-64	1/2"
		13	0,095	2,41	0,935	23,75	0,916	23,27	1,015	25,78	TR1259	TRR-22	TR1260	TRR-22-A	TRM-64	1/2"
		14	0,083	2,11	0,959	24,36	0,935	23,75	1,044	26,52	TR1261	TRR-23	TR1262	TRR-23-A	TRM-65	1/2"
15		0,072	1,83	0,981	24,92	0,962	24,43	1,071	27,20	TR1263	TRR-24	TR1264	TRR-24-A	TRM-65	1/2"	
1-1/4" 31,7mm	8	0,165	4,19	0,92	23,37	0,901	22,89	1,010	25,65	TR1265	TRR-25	TR1266	TRR-25-A	TRM-65	1/2"	
	9	0,148	3,76	0,954	24,23	0,935	23,75	1,044	26,52	TR1261	TRR-23	TR1262	TRR-23-A	TRM-65	1/2"	
	10	0,134	3,40	0,982	24,94	0,962	24,43	1,071	27,20	TR1263	TRR-24	TR1264	TRR-24-A	TRM-65	1/2"	
	11	0,120	3,05	1,010	25,65	0,990	25,15	1,099	27,91	TR1267	TRR-26	TR1268	TRR-26-A	TRM-66	1/2"	
	12	0,109	2,77	1,032	26,21	1,013	25,73	1,122	28,50	TR1269	TRR-27	TR1270	TRR-27-A	TRM-66	1/2"	
	13	0,095	2,41	1,060	26,92	1,041	26,44	1,150	29,21	TR1271	TRR-28	TR1272	TRR-28-A	TRM-67	1/2"	
	14	0,083	2,11	1,084	27,53	1,060	26,92	1,169	29,69	TR1273	TRR-29	TR1274	TRR-29-A	TRM-67	1/2"	
	15	0,072	1,83	1,106	28,09	1,087	27,61	1,196	30,38	TR1275	TRR-30	TR1276	TRR-30-A	TRM-67	1/2"	
1-3/8" 34,9mm	8	0,165	4,19	1,045	26,54	1,026	26,06	1,135	28,83	TR1277	TRR-31	TR1278	TRR-31-A	TRM-67	1/2"	
	9	0,148	3,76	1,079	27,41	1,060	26,92	1,169	29,69	TR1273	TRR-29	TR1274	TRR-29-A	TRM-67	1/2"	
	10	0,134	3,40	1,107	28,12	1,087	27,61	1,196	30,38	TR1275	TRR-30	TR1276	TRR-30-A	TRM-67	1/2"	
	11	0,120	3,05	1,135	28,83	1,115	28,32	1,224	31,09	TR1279	TRR-32	TR1280	TRR-30-A	TRM-68	1/2"	
	12	0,109	2,77	1,157	29,39	1,133	28,78	1,242	31,55	TR1281	TRR-32	TR1282	TRR-32-A	TRM-68	1/2"	
	13	0,095	2,41	1,185	30,10	1,160	29,46	1,275	32,39	TR1283	TRR-33	TR1284	TRR-33-A	TRM-69	1/2"	
	14	0,083	2,11	1,209	30,71	1,179	29,95	1,294	32,87	TR1285	TRR-34	TR1286	TRR-34-A	TRM-70	1/2"	
	15	0,072	1,83	1,231	31,27	1,206	30,63	1,321	33,55	TR1287	TRR-35	TR1288	TRR-35-A	TRM-70	1/2"	
1-1/2" 38,1mm	8	0,165	4,19	1,170	29,72	1,145	29,08	1,260	32,00	TR1289	TRR-34	TR1290	TRR-34-A	TRM-69	1/2"	
	9	0,148	3,76	1,204	30,58	1,145	29,08	1,294	32,87	TR1285	TRR-34	TR1286	TRR-34-A	TRM-70	1/2"	
	10	0,134	3,40	1,232	31,29	1,206	30,63	1,321	33,55	TR1287	TRR-35	TR1288	TRR-35-A	TRM-70	1/2"	
	11	0,120	3,05	1,260	32,00	1,235	31,37	1,350	34,29	TR1291	TRR-36	TR1292	TRR-36-A	TRM-70	1/2"	
	12	0,109	2,77	1,282	32,56	1,257	31,93	1,372	34,85	TR1293	TRR-37	TR1294	TRR-37-A	TRM-70	1/2"	
	13	0,095	2,41	1,310	33,27	1,285	32,64	1,400	35,56	TR1295	TRR-37	TR1296	TRR-37-A	TRM-71	1/2"	
	14	0,083	2,11	1,334	33,88	1,285	32,64	1,400	35,56	TR1295	TRR-37	TR1296	TRR-37-A	TRM-71	1/2"	
	15	0,072	1,83	1,356	34,44	1,331	33,81	1,446	36,73	TR1297	TRR-38	TR1298	TRR-38-A	TRM-71	1/2"	
	16	0,065	1,65	1,370	34,80	1,331	33,81	1,446	36,73	TR1297	TRR-38	TR1298	TRR-38-A	TRM-71	1/2"	
	17	0,058	1,47	1,384	35,15	1,331	33,81	1,472	37,39	TR1299	TRR-38	TR1300	TRR-38-A	TRM-72	1/2"	
	18	0,049	1,24	1,402	35,61	1,331	33,81	1,472	37,39	TR1299	TRR-38	TR1300	TRR-38-A	TRM-72	1/2"	
	19	0,042	1,07	1,416	35,97	1,331	33,81	1,472	37,39	TR1299	TRR-38	TR1300	TRR-38-A	TRM-72	1/2"	
20	0,035	0,89	1,430	36,32	1,331	33,81	1,472	37,39	TR1299	TRR-38	TR1300	TRR-38-A	TRM-72	1/2"		

See our selection of Roll Motors to suit the 800 series Tube Expanders



TES-Mini 2 Electric



K50 Pneumatic

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TUBE EXPANDERS

PBE PARALLEL BOILER SERIES



- ▶ Designed for expanding tubes in Fire and Water Tube Boilers
- ▶ Ideal for re-rolling leaky tubes and new tubes

EXPANDER SIZE	EXPANSION RANGE mm	ROLLS	STANDARD ROLL LENGTH mm *	MANDREL	SHORT MANDREL SET (3PCS)	SQUARE DRIVE SIZE
PBE – 19	19 – 22mm	RR12	42mm	TK19	--	1/2"
PBE – 20	20 – 23mm	RR12	42mm	TK20	--	1/2"
PBE – 22	22 – 25mm	RR13	42mm	TK22	--	1/2"
PBE – 25	25 – 28mm	RR13	42mm	TK25	--	1/2"
PBE – 28	28 – 32mm	RR16	42mm	TK28	--	3/4"
PBE – 29	29 – 33mm	RR16	42mm	TK29	--	3/4"
PBE – 30	30 – 34mm	RR16	42mm	TK30	--	3/4"
PBE – 32	32 – 36mm	RR17	42mm	TK32	--	3/4"
PBE – 35	35 – 41mm	RR21	42mm	TK37	TKK37	3/4"
PBE – 37	37 – 43mm	RR22	42mm	TK37	TKK37	3/4"
PBE – 40	40 – 46mm	RR40	50mm	TK42	TKK42	3/4"
PBE – 42	42 – 48mm	RR23	50mm	TK42	TKK42	3/4"
PBE – 44	44 – 50mm	RR23	50mm	TK44	TKK44	3/4"
PBE – 47	47 – 54mm	RR24	50mm	TK47	TKK47	3/4"
PBE – 49	49 – 56mm	RR24	50mm	TK49	TKK49	3/4"
PBE – 52	52 – 59mm	RR25	50mm	TK49	TKK49	3/4"
PBE – 54	54 – 62mm	RR26	50mm	TK54	TKK54	3/4"
PBE – 57	57 – 66mm	RR27	50mm	TK57	TKK57	3/4"
PBE – 60	60 – 69mm	RR28	50mm	TK57	TKK57	3/4"
PBE – 65	65 – 74mm	RR29	50mm	TK65	TKK65	3/4"
PBE – 68	68 – 78mm	RR30	50mm	TK72	TKK72	1"
PBE – 72	72 – 82mm	RR31	50mm	TK72	TKK72	1"
PBE – 77	77 – 87mm	RR32	50mm	TK77	TKK77	1"
PBE – 82	82 – 92mm	RR33	50mm	TK82	TKK82	1"
PBE – 86	86 – 96mm	RR34	50mm	TK86	TKK86	1"
PBE – 90	90 – 102mm	RR34	50mm	TK90	TKK90	1"
PBE – 96	96 – 108mm	RR35	50mm	TK96	TKK96	1"

See our selection of Roll Motors to suit the 800 series Tube Expanders



Tes-Mini 2
Electric

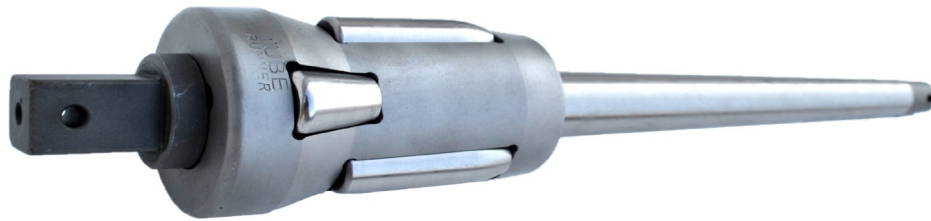


K70
Pneumatic



TUBE EXPANDERS

KBE FLARED BOILER SERIES



- ▶ Designed for expanding and flaring tubes in Boilers, Superheaters, Waterwalls and Economisers
- ▶ Three expanding rolls and three flaring rolls, simultaneously expands and flares

EXPANDER SIZE	EXPANSION RANGE mm	ROLLS	STANDARD ROLL LENGTH mm *	MANDREL	SHORT MANDREL SET (3PCS)	SQUARE DRIVE SIZE
KBE - 19	19 - 22mm	RR12RK5	42mm	TK19	--	1/2"
KBE - 20	20 - 23mm	RR12RK5	42mm	TK20	--	1/2"
KBE - 22	22 - 25mm	RR12RK5	42mm	TK22	--	1/2"
KBE - 23	23 - 26mm	RR13RK6	42mm	TK23	--	1/2"
KBE - 24	24 - 27mm	RR13RK6	42mm	TK24	--	1/2"
KBE - 25	25 - 28mm	RR13RK5	42mm	TK25	--	1/2"
KBE - 27	27 - 30mm	RR15RK7	42mm	TK27	--	1/2"
KBE - 28	28 - 32mm	RR16RK8	42mm	TK28	TKK28	3/4"
KBE - 29	29 - 33mm	RR16RK8	42mm	TK29	TKK29	3/4"
KBE - 30	30 - 34mm	RR16RK8	42mm	TK30	TKK30	3/4"
KBE - 32	32 - 36mm	RR17RK9	42mm	TK32	TKK32	3/4"
KBE - 35	35 - 41mm	RR21RK35	42mm	TK37	TKK37	3/4"
KBE - 37	37 - 43mm	RR22RK10	42mm	TK37	TKK37	3/4"
KBE - 40	40 - 46mm	RR40RK40	50mm	TK42	TKK42	3/4"
KBE - 42	42 - 48mm	RR23RK11	50mm	TK42	TKK42	3/4"
KBE - 44	44 - 50mm	RR23RK11	50mm	TK44	TKK44	3/4"
KBE - 47	47 - 54mm	RR24RK12	50mm	TK47	TKK47	3/4"
KBE - 49	49 - 56mm	RR24RK12	50mm	TK49	TKK49	3/4"
KBE - 52	52 - 59mm	RR25RK13	50mm	TK49	TKK49	3/4"
KBE - 54	54 - 62mm	RR26RK14	50mm	TK54	TKK54	3/4"
KBE - 57	57 - 66mm	RR27RK15	50mm	TK57	TKK57	3/4"
KBE - 60	60 - 69mm	RR28RK16	50mm	TK57	TKK57	3/4"
KBE - 65	65 - 74mm	RR29RK17	50mm	TK65	TKK65	3/4"
KBE - 68	68 - 78mm	RR30RK18	50mm	TK72	TKK72	1"
KBE - 72	72 - 82mm	RR31RK19	50mm	TK72	TKK72	1"
KBE - 77	77 - 87mm	RR32RK20	50mm	TK77	TKK77	1"
KBE - 82	82 - 92mm	RR33RK21	50mm	TK82	TKK82	1"
KBE - 86	86 - 96mm	RR34RK22	50mm	TK86	TKK86	1"
KBE - 90	90 - 102mm	RR34RK22	50mm	TK90	TKK90	1"
KBE - 96	96 - 108mm	RR35RK23	50mm	TK96	TKK96	1"

See our selection of Roll Motors to suit the 800 series Tube Expanders



Tes-Mini 2
Electric



K70
Pneumatic



TUBE EXPANDERS

P2 SUGAR REFINERY EXPANDERS



- ▶ Adjustable reach tube expander for deep reach expansions from 1/2" (12mm) up to 4-3/4" (120mm)
- ▶ Parallel rolling with long effective double radius rolls
- ▶ Excellent as a touch-up expander for re-rolling leaky tube or for new constructions
- ▶ Longer reach available with different length rollers to suit SUGAR REFINERY tubes

TUBE OD.	BWG	EXPANSION RANGE				1/2" TO 4-3/4" TUBE SHEET THICKNESS			
		Min ID.	Max ID.	Min ID.	Max ID.	EXPANDER No.	60mm ROLLS	MANDREL	MANDREL SQUARE
		mm	Exp	Inch	Exp				
1-1/4"	16g	27.8	33.0	1.120	1.290	P2-280	998	T-290	12"
1-1/2"	7-11g	28.8	34.0	1.140	1.330	P2-290	1048	T-290	
	10-12g	29.8	35.0	1.173	1.337	P2-300	1089	T-290	12.7mm
1-3/4"	13-16g	31.8	37.0	1.251	1.456	P2-320	1143	T-320	
	8-9g	34.8	41.0	1.370	1.614	P2-350	RR21A	T-370	3/4"
2"	10-16g	36.8	43.0	1.448	1.692	P2-370	RR22A	T-370	
	7-10g	39.8	46.0	1.566	1.811	P2-400	RR40A	T-420	19mm
2-1/4"	11-12g	41.8	48.0	1.645	1.889	P2-420	RR23A	T-420	
	13-15g	43.8	50.0	1.724	1.968	P2-440	RR23A	T-440	
2-1/2"	16g	46.8	54.0	1.842	2.125	P2-470	RR24A	T-470	
	10-12g	48.8	56.0	1.921	2.204	P2-490	RR24A	T-490	1"
2-3/4"	14-16g	51.8	59.0	2.039	2.332	P2-520	RR25A	T-490	
	3"	11-12g	53.8	62.0	2.118	2.440	P2-540	RR26A	T-540
3-1/4"		13-16g	56.8	66.0	2.236	2.598	P2-570	RR27A	T-570
	3-1/2"	7-11g	59.8	69.0	2.354	2.716	P2-600	RR28A	T-570
3-3/4"		7-11g	64.8	75.0	2.551	2.952	P2-650	RR29A	T-650
	4"	13-15g	67.8	78.0	2.669	3.070	P2-680	RR30A	T-720
4-1/4"		7-12g	72.0	82.0	2.834	3.228	P2-720	RR31A	T-720
	4-1/2"	13-16g	77.0	87.0	3.030	3.430	P2-770	RR32A	T-720
4-3/4"		10-16g	82.0	92.0	3.228	3.622	P2-820	RR34A	T-820
	4-1/2"	7-12g	86.0	96.0	3.385	3.779	P2-860	RR34A	T-860
4-3/4"		8-12g	90.0	102.0	3.543	4.015	P2-900	RR34A	T-900
	4-1/2"	13-16g	96.0	112.0	3.779	4.409	P2-960	RR35A	T-960

See our selection of Roll Motors to suit the 800 series Tube Expanders



Tes-Mini 2
Electric



K70
Pneumatic



K20

HEAVY DUTY PNEUMATIC ROLLING MOTOR



The K20 is a heavy duty pneumatic torque Controlled motor for the expansion of tubes used in Heat Exchangers, Condensers and Coolers.

K20 pneumatic rolling motor is designed for the fast and accurate torque controlled rolling of tubes from 1/4" – 1/2" OD (6.3mm – 12.7mm OD). This uniquely designed tool with automatic reverse, expands tubes to a preset torque, at which point it automatically trips over to its reverse rotation, backing itself out of the tube ready for the next expansion.

The process is fast and effortless making it the ideal tool for production rolling applications. Our K-20 Models are available in 500, 1800 & 2500 rpm (see chart for suggested Tube Diameters). All models are furnished with their own carrying case & instruction manual.

Features

- ▶ Heavy duty & highly durable
- ▶ Ensures precise, repeat expansions
- ▶ Reliable & easy to use
- ▶ Automatic reverse trigger control

MODEL	TUBE CAPACITY		FREE SPEED	MAX TORQUE	LENGTH	WEIGHT	CHUCK SIZE
K20-2500	6.3mm	1/4"	2500 RPM	0.9 NM	205mm	1.1 KG	1/4"
				2.42 ft.lbs	8"	2.42 lbs	
K20-1800	9.5mm	3/8"	1800 RPM	3.05 NM	205m	1.1 KG	1/4"
				2.25 ft.lbs	8"	2.42 lbs	
K20-550	12.7mm	1/2"	550 RPM	8.47 NM	219mm	1.2 KG	1/4"
				6.25 ft.lbs	8 3/5"	2.64 lbs	



K50

HEAVY DUTY PNEUMATIC ROLLING MOTOR



The K50 is a heavy duty pneumatic torque controlled motor for the expansion of tubes used in Heat Exchangers, Condensers and Coolers.

This machine is particularly well suited to extended periods of operation. It features an ergonomically designed push/pull throttle mechanism to reduce operator fatigue.

The torque control clutch mechanism is easily set and ensures precise, repeat expansions over long periods of use.

Three machines are available to suit tubes of nominal sizes 3/4", 1" and 1 1/4".



Features

- ▶ Heavy Duty & Highly Durable
- ▶ Ensures Precise, repeat expansions
- ▶ Reliable and easy to use.
- ▶ Ergonomic push/pull lever throttle

MODEL	TUBE CAPACITY		FREE SPEED	MAX TORQUE	LENGTH	WEIGHT	STANDARD CHUCK SIZE	OPTIONAL CHUCK SIZE
K50-1250	19mm	3/4"	1250 RPM	12.2 NM	311mm	4.8 KG	3/8"	1/2"
				108 in.lb	12 1/4"	10.5 lbs		
K50-600	25mm	1"	485 RPM	21.8 NM	311mm	4.8 KG	3/8"	1/2"
				193 in.lb	12 1/4"	10.5 lbs		
K50-400	32mm	1 1/4"	400 RPM	36.0 NM	311mm	4.8 KG	3/8"	1/2"
				318 in.lb	12 1/4"	10.5 lbs		



K60

HEAVY DUTY PNEUMATIC ROLLING MOTOR

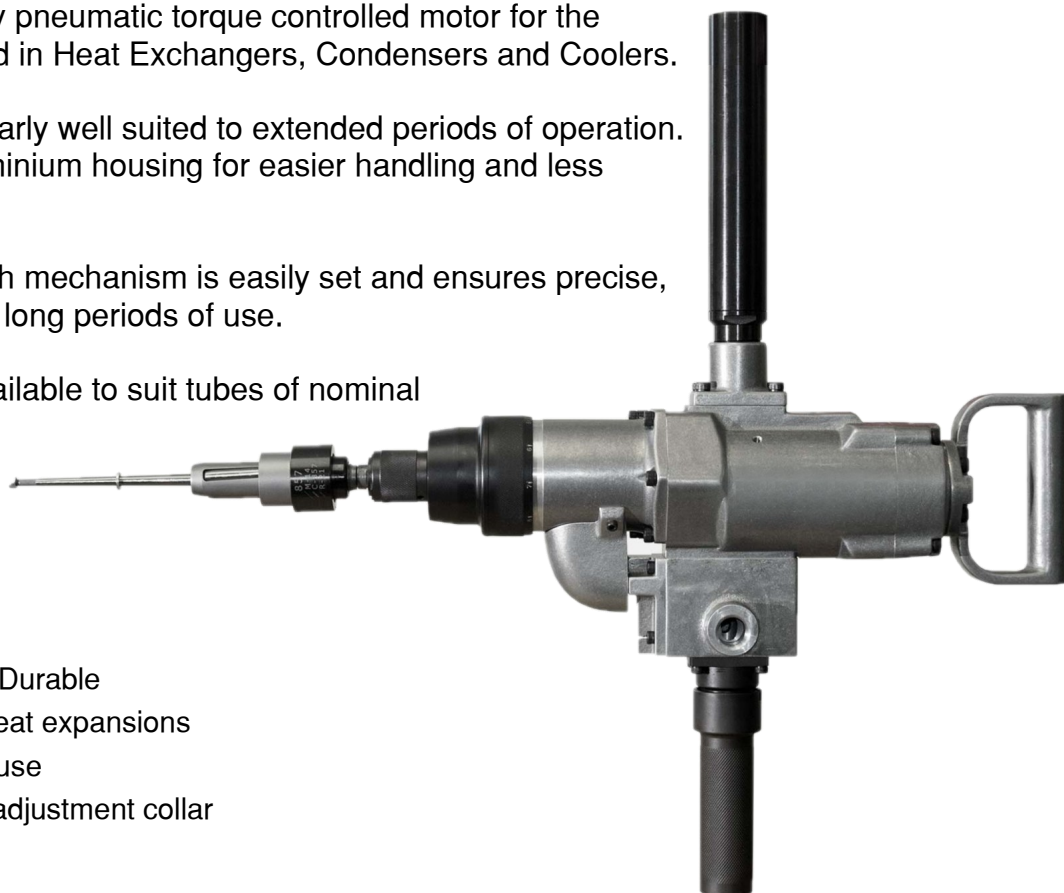


The K60 is a heavy duty pneumatic torque controlled motor for the expansion of tubes used in Heat Exchangers, Condensers and Coolers.

This machine is particularly well suited to extended periods of operation. It has a lightweight aluminium housing for easier handling and less operator fatigue.

The torque control clutch mechanism is easily set and ensures precise, repeat expansions over long periods of use.

Three machines are available to suit tubes of nominal sizes 1 1/2", 2" & 2 1/2".



Features

- ▶ Heavy Duty & Highly Durable
- ▶ Ensures Precise, repeat expansions
- ▶ Reliable and easy to use
- ▶ Simple dial-a-torque adjustment collar

MODEL	TUBE CAPACITY		FREE SPEED	MAX TORQUE	LENGTH	WEIGHT	STANDARD CHUCK SIZE	OPTIONAL CHUCK SIZE
K60-900	38.1mm	1 1/2"	756 RPM	41.6 NM	457mm	12.25 KG	3/8"	3/4"
				30.7 ft.lb	18"	27 lbs	1/2"	1"
K60-400	50.8mm	1"	400 RPM	82.5 NM	457mm	12.25 KG	3/4"	3/8"
				61 ft.lb	18"	27 lbs	1"	1/2"
K60-250	63.5mm	2 1/2"	220 RPM	135.5 NM	457mm	12.25 KG	3/4"	3/8"
				100 ft.lb	18"	27 lbs	1"	1/2"



K70

HEAVY DUTY PNEUMATIC ROLLING MOTOR



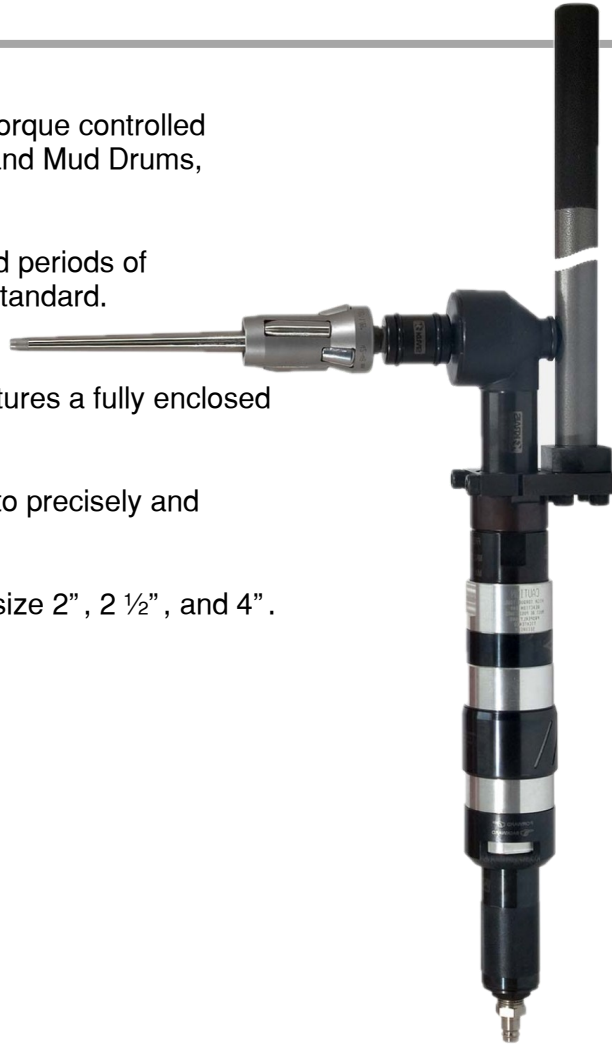
The **K70** is a heavy duty, right angle, pneumatic torque controlled motor for the expansion of Boiler tubes in Steam and Mud Drums, Fire Tube Boilers and similar equipment.

This machine is particularly well suited to extended periods of operation and is equipped with a Roll Throttle as standard. (A lever throttle is available as an option).

The machine has a unique head design which features a fully enclosed bearing for long life.

With Industry input the K70 has been engineered to precisely and consistently expand boiler tubes.

3 machines are available to suit tubes of nominal size 2" , 2 1/2" , and 4" .



Features

- ▶ Heavy Duty & Highly Durable
- ▶ Ensures Precise, repeat expansions
- ▶ Reliable and easy to use.
- ▶ Roll throttle or lever throttle options

MODEL	TUBE CAPACITY		FREE SPEED	MIN TORQUE	MAX TORQUE	LENGTH	WEIGHT	STANDARD CHUCK SIZE	OPTIONAL CHUCK SIZE
K73-RT-375	2"	50.8mm	375 RPM	40 NM	110 NM	530mm	5.8 KG	3/4"	1/2"
				30 ft.lbs	82 ft.lbs	20"	13 lbs		
K73-RT-190	2 1/2"	63.5mm	190 RPM	95 NM	200 NM	530mm	5.8 KG	3/4"	1/2"
				70 ft.lbs	140 ft.lbs	20"	13 lbs		
K72-RT-90	4"	101.6mm	90 RPM	200 NM 150 ft.lbs	410 NM 305 ft.lbs	550mm 22"	6.7 kg 15 lbs	3/4" 1"	-



TES-MINI 2

ELECTRIC ROLL CONTROLLER



The **TES-Mini 2** is a semi automatic torque controller for the precise expansion of ferrous, non-ferrous and alloy tubing. It is ideal for Condenser/Chillers, Heat Exchangers and Boilers. It's one of our most popular tools because of its accuracy, speed and ease of use. The second generation of TES-Mini has been designed with direct input from our customers and utilizes the latest electronic components. As a direct result of these new technologies, gains in



TES-Mini 2 in conjunction with one of our tube rolling motors will improve productivity and safety, while

Main TES Mini 2 features

- Microprocessor controlled tube expansion;
- Consistent torque control over 1 or 10,000 expansions;
- Controls torque during long series of tube expanding;
- Programmable torque shut-off value and high/low torque limits;
- Reverse button for retracting expanders from the tubes;
- Programmable timers for; cycle start, reverse pause, end of cycle, and a suppression timer for low torque value settings;
- CE Certified design.

TES Mini 2 functions

- Speed adjustment or limit (depends on motor type)
- Torque adjustment
- Suppression time adjustments
- Pause time adjustments
- Softstart delay
- Report generation (up to 9999 cycles)
- Works with 110 V and 230 V



TES Mini 2 Motors

* Tube Capacity depends on material and technical condition of tube

MOTOR	VOLTAGE	WEIGHT		MOTOR POWER	FREE SPEED	MAX RPM UNDER LOAD	TORQUE				TUBE CAPACITY*	
							[NM]		[FT-LBS]		[INCHES]	
		[KG]	[LBS]				MIN	MAX	MIN	MAX	MIN	MAX
HT-0	230V	1,2	2,4	460 W	2300	1700	0,7	10,0	0,5	7,4	1/4	1/2
	110V			230 W	1150	850	0,3	5,0	0,2	3,5	1/5	3/8
ES-0	230V	3,2	7,0	1150 W	680	450	12,0	45,0	8,8	33,0	5/8	1 1/4
	110V			575 W	340	225	6,0	22,5	4,4	16,5	3/8	7/8
ES-2	230V	3,2	7,0	1150 W	650	430	8,0	43,0	6,0	32,0	5/8	1 1/8
	110V			575 W	325	215	4,0	21,5	3,0	16,0	3/8	3/4
DU-0	230V	2,0	4,4	650 W	628	450	3,0	42,0	2,2	30,5	5/8	1
	110V			325 W	314	225	1,5	21,0	1,1	15,7	3/8	1/2
DU-1	230V	8,6	17,6	2000 W	150	120	12,0	250,0	8,8	185,0	3/4	2
				250	219							
				445	380							
				720	650							
110V	1000 W	75	60	6,0	125,0	4,4	92,5	3/8	1			
	125	110										
	222	190										
	360	325										
K90-E-280	230V	10,0	22,0	1150 W	274	250	40,0	190,0	29,5	140,1	1 1/4	2 1/2
	110V			575 W	137	125	20,0	95,0	14,7	70,0	5/8	1 1/4
K90-E-190	230V	10,0	22,0	1150 W	142	129	50,0	260,0	36,8	191,8	1 1/2	3
	110V			575 W	71	65	25,0	230,0	18,4	95,9	7/8	1 1/2
K90-E-90	230V	10,0	22,0	1150 W	90	81	70,0	510,0	51,6	376,2	2	5
	110V			575 W	45	40	35,0	255,0	25,8	188,1	1	2 1/2



HT-0



ES-0
ES-2



DU-0



DU-1



K90-E-90 / 190 / 280

TES-3000

ELECTRIC ROLL CONTROLLER



Basic parameters

TES-3000:	400V 50/60Hz
For tubes:	1/2" – 1 1/2"
Control unit weight:	4 kg
Footswitch weight:	5 kg
Dimensions:	800 x 200 x 900 mm

The **TES-3000** digital Tube Expanding System features a range of powerful and efficient servo motors. Variable Speed and Torque repeatability +/- 1% are a few of the advantages of this system. Created for the demanding customer, this system ensures uniform tube expansion over a wide range of tube diameters and materials, greater efficiency and accuracy combined with ease of use make this system simple, affordable and extremely fast.

Main TES-3000 features

- Purely digital and modular system.
- High tech servo drive and motor assure accuracy, efficiency, quality and repeatability of the results.
- Extremely easy and user friendly interface on 7" touch screen.
- Supported languages: English, Korean, German, Spanish, Portuguese, Chinese, Polish.
- USB Flash Drive available to dump expanding log files (48 MB internal storage space for log files)
- Easy software upgrade with USB flash memory
- CE compliant. In full accordance with RoHS compliance.
- Motor equipped with EnDat encoder.



Display & user interface "head"

User friendly, extremely easy to setup interface based on 7" TFT display featuring high reliable industrial resistive touch panel; high touch accuracy. With high hardness and long lifetime.

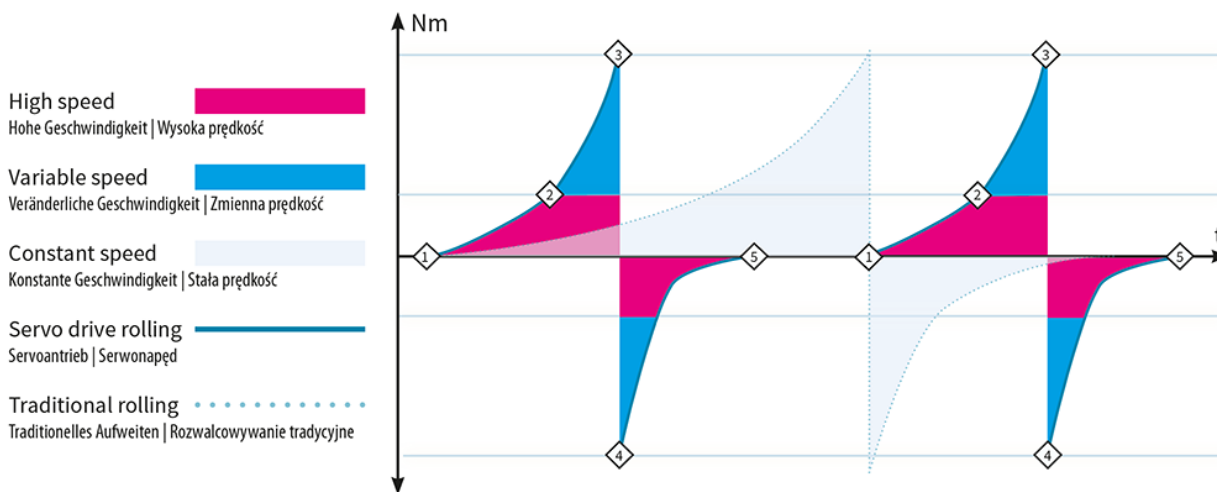
Motor "does the work"

Comfortable and save cable connectors and IP56 protection.

Servo drive "heart"

Reliable, brushless, maintenance free servo motors supplied by an OEM within the automation industry, are ideally suited to tube expanding when combined with our custom gear packages. Servo drive is controlled by a 32-bit RISC processor. Equipped EnDat encoder and thermistor motor protection.

SERVO DRIVE WORKING SCHEME | BETRIEBSSCHEMA DES SERVOANTRIEBS | SCHEMAT PRACY SERWONAPĘDU



TES-3000 software

- Central unit with user friendly interface and 7" touch screen allows configuration of different motor type with their predefined min/ max values and to set up required expanding parameters.
- Torque Wizard helps to calculate torque settings based on: wall reduction, feed angle, mandrel taper, tube diameter, tube yield (ultimate tensile strength), wall thickness (gauge, expansion length).
- 3 operating modes available: **Manual:** Single expansion, **Semi-auto:** Single expansion with autoreverse, **Auto:** Expansion with autoreverse in endless loop until operator stops.
- Configurable expanding timers: reverse rolling time, time between expanding cycles (to move expander from one to another tube), time to expand with maximum rpm in the initial expanding phase
- Other features: Expanding counter, Color status lamps, Metric and imperial units available, Translated to many languages.



Motors for TES-3000

We offer a full range of motors, you can choose a proper one that fits your needs. Each motor is equipped with one of 5 of the gear boxes. Each with protection level IP56.

DRIVE	PHASE VOLTAGE	WEIGHT	MAX RPM	TORQUE (WITH TES-3000)				
				NM		FT.LB		
				MIN	MAX	MIN	MAX	
	S3000	3/400V	5.0 Kg	3000	0.2	2.5	0.1	1.8
	S6000	3/400V	5.0 Kg	6000	0.2	2.5	0.1	1.8
	S5	3/400V	5.0 Kg	1662	2.3	8.6	1.6	6.3
	S4	3/400V	5.0 Kg	1500	2.7	9.5	1.9	7.0
	S3	3/400V	5.0 Kg	1091	3.0	13.0	2.2	9.5
	S2	3/400V	5.0 Kg	800	2.8	18.0	2.0	13.2
	S1	3/400V	5.0 Kg	600	3.0	24.0	2.2	17.7
	S1-RA	3/400V	6.5 Kg	320	2.2	45.0	1.62	33.0
	S2-RA	3/400V	6.5 Kg	425	1.7	33.0	1.25	24.0
	S3-RA	3/400V	6.5 Kg	580	1.1	24.0	0.81	17.0
	S4-RA	3/400V	6.2 Kg	797	0.9	17.0	0.66	12.0
	S5-RA	3/400V	6.2 Kg	884	0.7	16.0	0.51	11.0
	G3000	3/400V	9.5 Kg	3000	0.5	18.0	3.68	13.27
	G2000	3/400V	9.5 Kg	2000	0.8	23.0	5.9	16.96
	G1455	3/400V	9.0 Kg	1453	2.3	70.0	1.6	51.6
	G1000	3/400V	9.0 Kg	1000	3.4	102.0	2.5	75.2
	G400	3/400V	9.0 Kg	400	7.5	240.0	5.5	177.0

Motor which fits everywhere

The compact body right-angle rolling motor with pistol grip are excellent for use in tight and hard to reach places compared with standard rolling motors.

The convenient pistol grip can be positioned in 3 ways to suit the application and operator preferences. There are two buttons on the pistol grip, one for manual operation and an emergency stop button.



Telescopic Shaft



tubes close and deep to the shell. The shaft is easy to handle, accurate and stable at all speeds.

We offer an articulated telescopic shaft, it is a convenient way to improve efficiency and great option to expand most inaccessible tubes.

The telescopic shaft is useful especially to roll



Built to work with the digital rolling system TES3000 with:

- G-400 drive
- G-1000 drive
- G-1455 drive

FlexHolder

We recommend the FlexHolder arm when using the TES-3000 control unit. This combination allows you to create a mobile workstation with an above average performance.

The Flexholder is an articulated arm that supports the weight and absorbs the torque of the rolling motor using a pneumatic counterbalance, which allows the user to effortlessly move the rolling motor into position. Our standard model features a 1.5m vertical and 1.5m horizontal reach (models with increased vertical and horizontal capacity are available upon request). The column can be easily removed from the base for transportation purposes.



TES3000-APLS

Automatic Pneumatic Lubricating System.

Dedicated and integrated for the 2023 version of TES-3000 dispenses oil drops precisely into the rolls and mandrel. It eliminates the problem of the user applying the correct amount of lubrication and reduces tool wear.



TUBE CUTTERS

TUBE END FACER



- ▶ For facing back tubes after installation. Adjustable for length of protrusion.
- ▶ The Tube End Facer can be driven with a Pneumatic or Electric drill motor.
- ▶ The tool uses various pilots to match tube gauge thickness.
- ▶ Cutters available for use on Stainless Steel.

TUBE SIZE (OD.)		PART NUMBER		
mm	Inch	Pilot Range	Complete Tool	Cutter Bit
9.5	3/8"	16-20g	42.EF0375	42.EFC0375
12.5	1/2"	16-20g	42.EF0500	42.EFC0500
15.8	5/8"	14-18g	42.EF0625	42.EFC0625
19.0	3/4"	10-18g	42.EF0750	42.EFC0750
22.2	7/8"	14-18g	42.EF0875	42.EFC0875
25.4	1"	10-18g	42.EF1000	42.EFC1000
31.7	1 1/4"	10-18g	42.EF1250	42.EFC1250
38.1	1 1/2"	10-18g	42.EF1500	42.EFC1500
50.8	2"	10-18g	42.EF2000	42.EFC2000
63.5	2 1/2"	10-18g	42.EF2500	42.EFC2500



GROOVING TOOLS

TUBE SHEET GROOVING TOOLS



Note: Tool shown includes optional rollers

- ▶ The grooving tool allows the cutting of grooves in tube sheet holes, cutting depth can be adjusted from 22.5mm to 54.0mm.
- ▶ Standard grooving configuration of 3-6-3. 3mm groove, 6mm space then another 3mm groove. Other configurations are available as a special order.
- ▶ Circumferential Rollers can be specified as an option to extend mandrel life.

HOLE SIZE	COMPLETE TOOL	MORSE TAPER	GROOVING BLADES	CUTTER RETAINER SPRING
*3/8"	42.GT0375	3	42.3753-S	19.0018
*1/2"	42.GT0500	3	42.5003-S	19.0021
5/8"	42.GT0625	3	42.6203-S	19.0019
3/4"	42.GT0750	3	42.7503-S	19.0020
7/8"	42.GT0875	3	42.7503-S	19.0020
1"	42.GT1000	3	42.7503-S	19.0020
1 1/8"	42.GT1125	4	42.7503-S	19.0020
1 1/4"	42.GT1250	4	42.7503-S	19.0020
1 1/2"	42.GT1500	4	42.7503-S	19.0020
1 3/4"	42.GT1750	4	42.7503-S	19.0020
2"	42.GT2000	5	42.7503-S	19.0020
2 1/4"	42.GT2250	5	42.7503-S	19.0020
2 1/2"	42.GT2500	5	42.7503-S	19.0020

Tools available for tube sizes up to 4" and for metric size tubes, please ask for details.

Items marked * are not available with Rollers.



TUBE GUIDE

0.5" TO 1.5" (12.7-38.1mm)



Tube Guides, also known as Tube Pilots, protect the tube end during installation of tubes into the shell of the heat exchanger and ensures accurate alignment of the tube while passing through the baffle plates.

- ▶ To 'Guide' the tube through the tube sheets and baffle plates during tube insertion
- ▶ High strength Nylon bristles holds Tube Guide firmly in tube

Tube OD		Wall Gauge Range	Tube Pilot
mm	inch		
12.7mm	1/2"	13-16	17.7012-13-16
		17-20	17.7012-17/20
15.9mm	5/8"	10-12	17.7016-10-12
		13-16	17.7012-13/16
		17-20	17.7016-17/20
19.1mm	3/4"	10-12	17.7019-10/12
		13-16	17.7019-13/16
		17-20	17.7019-17/20
22.2mm	7/8"	10-12	17.7022-10/12
		13-16	17.7022-13/16
		17-20	17.7022-17/20
25.4mm	1"	10-12	17.7025-10/12
		13-16	17.7025-13/16
		17-20	17.7025-17/20
28.6mm	1-1/8"	10-12	17.7028-10/12
		13-16	17.7028-13/16
		17-20	17.7028-17/20
31.8mm	1-1/4"	10-12	17.7032-10/12
		13-16	17.7032-13/16
		17-20	17.7032-17/20
38.1mm	1-1/2"	10-12	17.7038-10/12
		13-16	17.7038-13/16
		17-20	17.7038-17/20



TUBE CLEANING BRUSHES



Nylon Wire Brush



Brass Wire Brush



Steel Wire Brush



Stainless Wire Brush

Tube Cleaning Brushes consisting of bristles are ideal for grinding, deburring, cleaning, polishing and fine surface finishing of plastic and metal parts. Also known as an interior brush, bottle brush, pipe brush, pipe cleaning brush, tube brush and twisted wire brush. These brushes are supplied with an M6 external thread and can be extended to the required working length using twisted wire extension rods and handles available in individual 1 metre lengths.

The tube cleaning brushes can also be used to clean tube sheet holes prior to grooving or expanding.

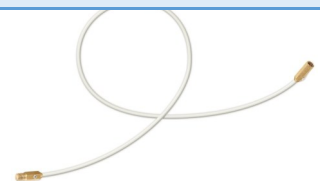
Brush Material	Range	Thread
Nylon	6-20mm	M6
	30-100mm	1/2"
Brass	6-20mm	M6
Steel	6-20mm	M6
	30-120mm	1/2"
Stainless Steel	6-20mm	M6



Twisted Wire Extension Rod 1000mm x W1/2"



Twisted Wire Extension Handle 1000mm x W1/2"



Super Flexible Extensions Rod 1000mm x W1/2"



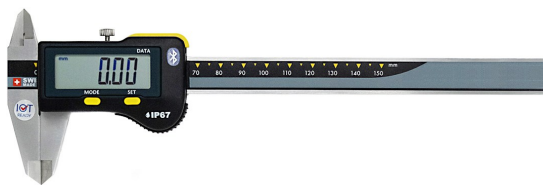
METROLOGY

MEASURING INSTRUMENTS



General measuring instruments

We supply the heat exchanger industry with metrology equipment, such as vernier calipers, outside micrometers and most commonly **3-point bore gauges**.



Bore gauge and ID gauges

Bore gauges and ID gauges are commonly used in the heat exchanger industry as they are designed for dimensional measurement or assessment of the internal diameter of components. Most commonly they'll be used for measuring the tube sheet hole prior to expanding a tube in place, and then used to measure the tube ID after expansion to ensure correct expansion.

These 3-point bore gauges have three contact points mounted on an arm that expands out from a central point. These can detect lobe or out-of-roundness conditions, which is an advantage over 2-point ID gauges. Available in analogue or digital with some digital gauges offering data transfer via bluetooth to spreadsheets for mapping, reporting and providing control charts for QA processes.

Tube hole gauge



Digital gauge w/bluetooth



Quick trigger w/bluetooth



All digital bore gauges allow the user to measure in both inch/decimal and metric units. There are options for additional reach extensions to increase the capacity of these tools for Fin Fan and similar units.



TUBE-A-LUBE

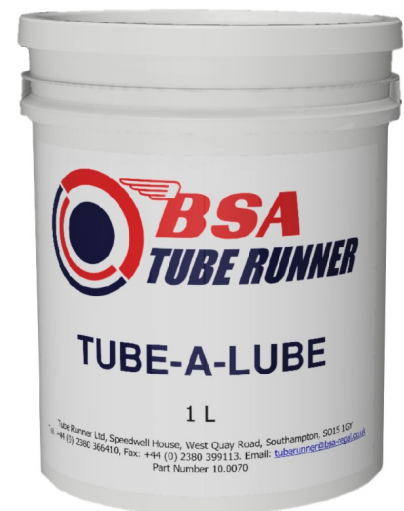
1.0 Ltr / 5.0 Ltr TUBS



Tube-A-Lube is a specialised formulation designed to enhance the efficiency and effectiveness of tube expansion processes in various industrial applications. This high-performance lubricant minimises friction, reduces wear and tear, and ensures smooth expansion of tubes, resulting in improved overall productivity and prolonged equipment life.

Key features

- **High Lubricity:** The lubricant is formulated with high-quality additives that provide exceptional lubricity, minimising friction between the expander and the tube surface.
- **Corrosion Protection:** Tube expander lubricant includes anti-corrosion agents that safeguard both the tube material and the expander, preventing damage caused by oxidation and corrosion.
- **Temperature Stability:** The lubricant is engineered to withstand a wide range of temperatures, ensuring consistent performance even in demanding operating conditions.
- **Non-Toxic and Environmentally Friendly:** This lubricant is designed to be non-toxic, environmentally friendly, and compliant with industry regulations, making it safe for both operators and the environment.



Applications

Tube expander lubricants find applications in a variety of industries where tube expansion processes are integral to operations. Some common applications include: Heat Exchangers, Boilers, Condensers, Chillers, Oil Coolers & HVAC Systems

Directions for use

Clean the tube surfaces and expander tool thoroughly before applying the lubricant.

Apply a thin, even layer of lubricant onto the tube's inner surface or the expander's contacting parts.

Perform the expansion process according to the manufacturer's guidelines.

After expansion, wipe off any excess lubricant from the tubes.

Storage: Store the tube expander lubricant in a cool, dry place away from direct sunlight and extreme temperatures. Ensure the container is tightly sealed when not in use.

Safety Precautions:

Avoid contact with eyes and skin. In case of contact, rinse with plenty of water. Keep out of reach of children and pets. Read and follow the manufacturer's safety instructions and recommendations before use.

Packaging: Tube-A-Lube is available in 1 litre or 5 litre tubs.

Disclaimer:

This specification sheet is for informational purposes only. Users are advised to refer to the manufacturer's product information, guidelines, and safety data sheets for accurate and up-to-date information before using the product. For specific technical details and recommendations, please consult the manufacturer or supplier of the tube expander lubricant.





PIPE BEVELLING

QUICK FACER

PORTABLE PIPE BEVELLER



Cutting Range	Minimum (ID)	Maximum (OD)
Metric	8mm	38mm
Imperial	5/16"	1-1/2"



The QuickFacer is a portable tube facing, weld end preparation and weld removal machine. It is a micro lathe designed for various tube materials, including stainless steel and other high chromium materials. QuickFacer machine can be used for machining tube sizes for 8mm ID to 38mm OD (0.314" - 1.5") and comes with a 50mm cutter head.

Standard set up

Microshaft with interchangeable guide shafts. Set cover 10mm to 15mm ID tubes
50mm (2") cutter head

Optional set up

Microshaft with interchangeable guide shafts. Set cover 8mm to 10mm ID tubes
Minishaft with interchangeable guide shafts. Set covers 12.4mm to 24mm ID tubes
37 degree OD bevel cutter head to suit 1/2" to 1-1/2" OD
45 degree ID weld removal/prepping cutter head to suit up to 1" OD
Tube end facing head specifically for tougher materials. Utilises 6% cobalt inserts.

Tube Cutting Specifications		
Total Cutting Range	8mm up to 38mm OD	5/16" up to 1-1/2" OD
Clamping Range	7.8mm up to 24mm ID	5/16" up to 1" ID
Cutter Feed Stroke	15mm	5/8"
Pneumatic Power	745 watts	1.0 hp
Weights & Dimensions	275mm x 310mm (10.8" x 12.2")	3.5 Kg / 7,7 lbs

Air Requirements		
Air Flow	480 l/min	17 cfm
Air Pressure	6 bar	90 psi
Min. Hose Size	10mm	3/8"



TB1 PREPPER

PORTABLE PIPE BEVELLER



Cutting Range	Minimum (ID)	Maximum (OD)
Metric	15mm	38mm
Imperial	5/8"	1-1/2"

The **TB1 Prepper** is a rugged, portable, machine designed for the removal of tube-to-tube sheet welds in heat exchangers.

This bevelling machine can also be used for facing and bevelling the ends of tube and pipe for general welding and fabrication processes.

Utilising a torque reacted locking system and durable taper roller bearings, this end preparation lathe is highly stable.

The machine is supplied with hand wheel feed as standard. A ratchet feed mechanism which is designed for weld removal applications where space may be limited, is available as an option.



Optional ratchet feed



**Available in
110V / 220V**



**Available in
18V Cordless**



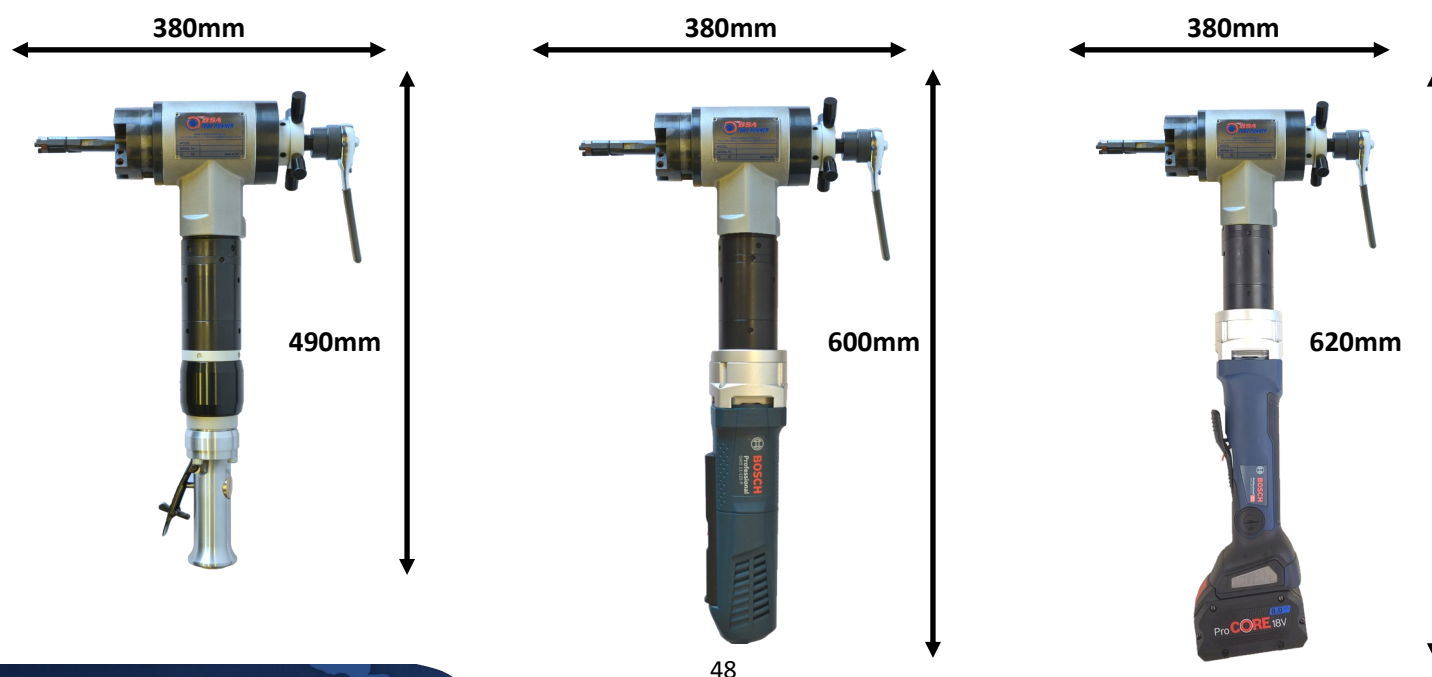
Specification

Tube Cutting Range		
Total Cutting Range	15mm up to 38mm OD	5/8" up to 1-1/2" OD
Clamping Range	15mm up to 28mm ID	5/8" up to 1-1/8" ID

Power options		
Electric - 110V / 220V	1100 watts	1.48 hp
Battery - 18V(5Ah)	1000 watts	1.34 hp
Pneumatic	745 watts	1.0 hp

Weights & Dimensions		
Electric	380 x 600mm 14" x 24"	10.2 Kg / 22.5 lbs
Battery	380 x 620mm 14" x 24"	10.75 Kg / 23.7 lbs (Inclusive of 8Ah battery)
Pneumatic	380 x 490mm 14" x 19"	9.2 Kg / 20.3 lbs
Cutter Feed Stroke	21mm	7/8"

Air Requirements		
Air Flow	900 l/min	32 cfm
Air Pressure	6 bar	90 psi
Min. Hose Size	10mm	3/8"



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TB3 PREPPER

PORTABLE PIPE BEVELLER



Cutting Range	Minimum (ID)	Maximum (OD)
Metric	25mm	89mm
Imperial	1"	3-1/2"

The **TB3 Prepper** is a rugged, portable, machine designed for the removal of tube-to-tube sheet welds in heat exchangers and boilers.

This bevelling machine can also be used for facing and bevelling the ends of tube and pipe for general welding and fabrication processes.

Utilising a torque reacted locking system and durable taper roller bearings, this end preparation lathe is highly stable.

The machine is supplied with hand wheel feed as standard. A ratchet feed mechanism which is designed for weld removal applications where space may be limited, is available as an option.



Optional ratchet feed



**Available in
110V / 220V**



**Available in
18V Cordless**



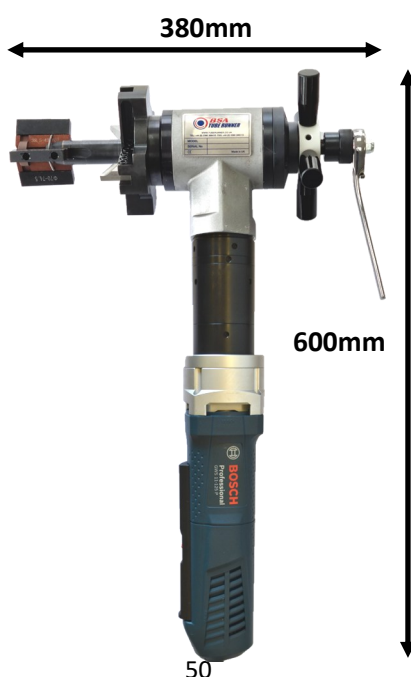
Specification

Tube Cutting Range		
Total Cutting Range	25mm up to 89mm OD	1" up to 3-1/2" OD
Clamping Range	25mm up to 76mm ID	1" up to 3" ID

Power options		
Electric - 110V / 220V	1100 watts	1.48 hp
Battery - 18V(5Ah)	1000 watts	1.34 hp
Pneumatic	745 watts	1.0 hp

Weights & Dimensions		
Electric	380 x 600mm 14" x 24"	10.2 Kg / 22.5 lbs
Battery	380 x 620mm 14" x 24"	10.75 Kg / 23.7 lbs
Pneumatic	380 x 490mm 14" x 19"	9.2 Kg / 20.3 lbs
Cutter Feed Stroke	21mm	7/8"

Air Requirements		
Air Flow	900 l/min	32 cfm
Air Pressure	6 bar	90 psi
Min. Hose Size	10mm	3/8"



COBRA 400

PORTABLE PIPE BEVELLER



Cutting Range	Minimum (ID)	Maximum (OD)
Metric	38mm	171mm
Imperial	1-1/2"	6-3/4"

The **COBRA 400** machine is a mid-size, High Power portable tube-prepping machine, designed to bevel, face and counter bore most types of tube and pipe work.

This versatile midrange machine utilises torque reacted mandrels which align themselves on the inside of the work piece enabling the machine to cover a range of 38.5mm (1 1/2") ID to 172mm (6 3/4") OD.

The Cobra 400 machine can also be used with Short Locking Units for machining short parallel pipe lengths and fittings.

A heavy duty worm and spur gear drive system combines a compact head design with smooth reliable power transmission.

Fitted with either an electric 110/240v or pneumatic motor the Cobra 400 has the ability to withstand the toughest working environments.

Preparations

- ▶ Bevel
- ▶ Face
- ▶ Counter Bore
- ▶ Bevel and Face in one
- ▶ Boiler membrane and Prep



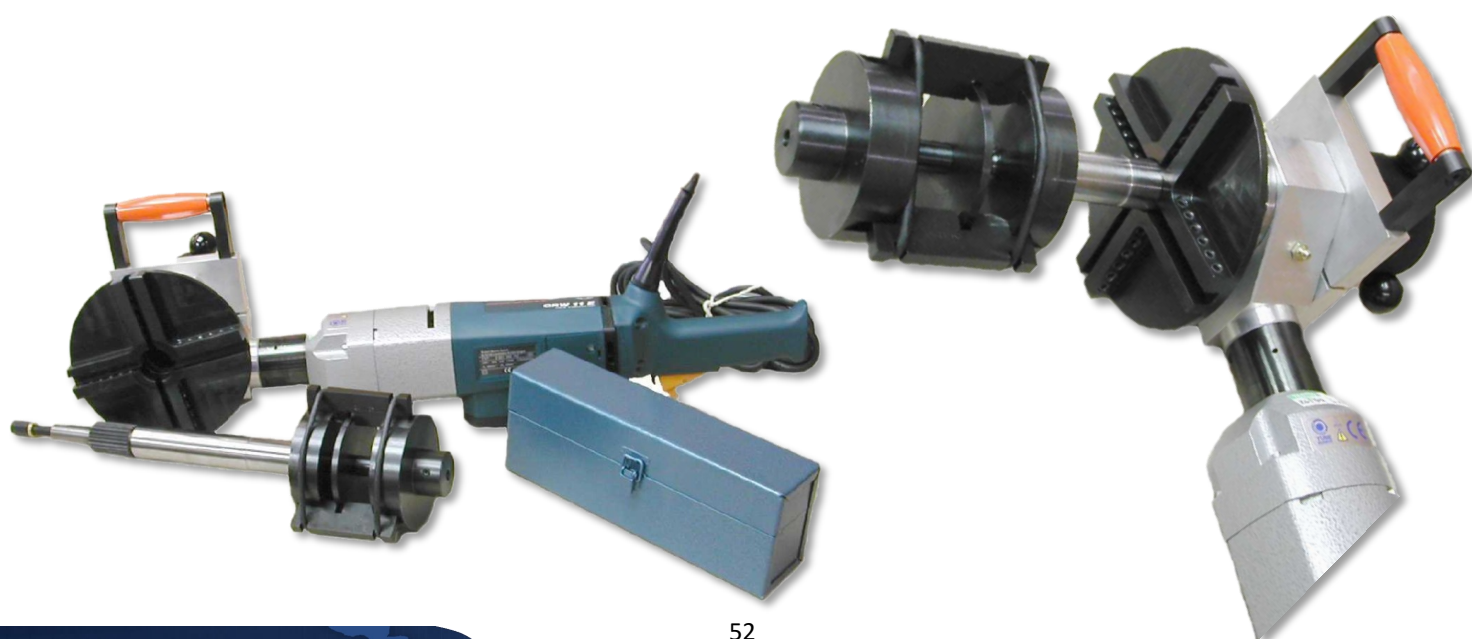
Specification

Tube Cutting Range	Metric	Imperial
Total Cutting Range	38mm up to 171mm OD	1-1/2" up to 6-3/4" OD
Optional Shaft 1 - Clamping Range	38mm up to 103mm ID	1-1/2" up to 4" ID
Optional Shaft 2 - Clamping Range	96mm up to 160mm ID	3-4/5" up to 6-1/3" ID

Power options	Metric	Imperial
Electric	670 watts	0.9 hp
Pneumatic	1500 watts	2.0 hp

Weights & Dimensions	Metric	Imperial
Electric	190 x 610mm 7-1/2" x 24"	13 Kg 29 lbs
Pneumatic	190 x 585mm 7-1/2" x 23"	12 Kg 26 lbs
Cutter Feed Stroke	32mm	1-1/4"

Air Requirements	Metric	Imperial
Air Flow	1800 l/min	60 cfm
Air Pressure	6 bar	90 psi
Hose Size	12.5mm	1/2"



SUPER ROCKET

PORTABLE PIPE BEVELLER



Cutting Range	Minimum (ID)	Maximum (OD)
Metric	90mm	305mm
Imperial	3-1/2"	12"

The Super Rocket machine is a High Power portable tube-prepping machine, designed to bevel, face and counter bore most types of tube and pipe work.

The high power and torque of the newly developed pneumatic motor combined with heavy duty worm and spur gear drive provide a rugged reliable machine for working on large diameter or heavy wall tube (eg. 5 1/2" Sched XX Heavy).

The motor provides the operator with a high degree of control over the cutting speed by means of an accurate lever throttle, whilst keeping operational noise levels to a minimum.

The machine utilises a versatile torque reacted shaft system to align on the inside of the work piece. The entire range of the machine (64mm to 300mm ID) is covered with just 2 shafts, minimising the number of parts required.

The construction of the shaft system is such that the shaft and machine can be mounted to the tube together, or the shaft can be mounted first and the machine then loaded to the shaft in order to ease operations in overhead or confined spaces.



Preparations

- ▶ Bevel
- ▶ Face
- ▶ Counter Bore
- ▶ Bevel and Face in one
- ▶ Boiler membrane and Prep

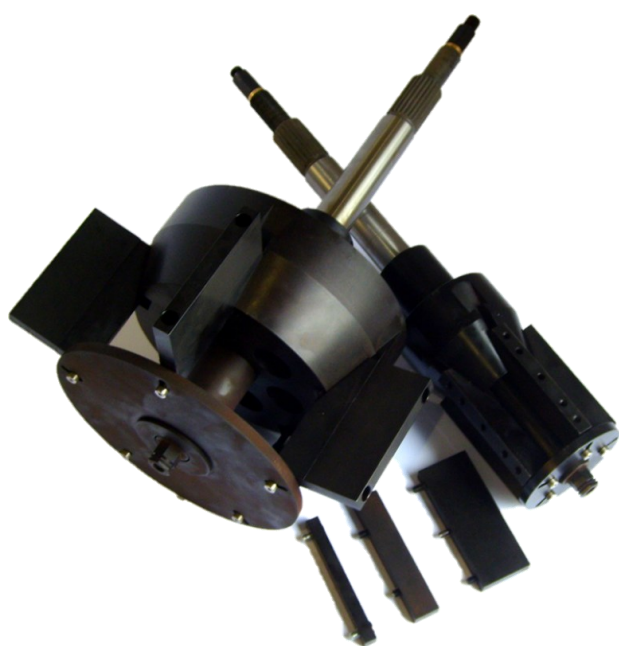


Specification

Tube Cutting Range	Metric	Imperial
Total Cutting Range	90mm up to 305mm OD	3-9/16" up to 12" OD
Optional Shaft 1 - Clamping Range	90mm up to 196mm ID	3-9/16" up to 7-3/4" ID
Optional Shaft 2 - Clamping Range	194mm up to 300mm ID	7-5/8" up to 11-3/4" ID

Dimensions	Metric	Imperial
Length	500mm	19-5/8"
Depth	700mm	27-1/2"
Weight (Machine)	19 kg	42 lbs
Weight (with Shaft 1)	25 kg	55 lbs
Weight (with Shaft 2)	35 kg	77 lbs
Cutter Feed	40mm	1-1/2"

Motor	Metric	Imperial
Power	1500 W	2.0 Hp
Air Flow	1800 l/min	60 cfm
Air Pressure	6 bar	90 psi
Hose Size	12.5mm	1/2"



MINIMILL 300 GASKET SEAT FACER



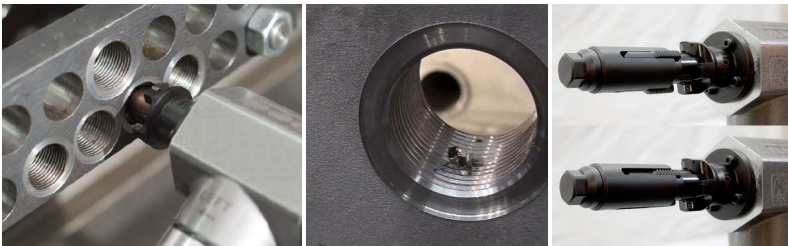
Gasket seat facing range

1-1/8" - 2-1/8" x 12 TPI

Special clamps to fit in thread.

Ideal for gasket seat machining of any size of fin fan cooler. A standard machine is equipped with a cutter head and a special locking system to fit your application. The machine locks directly into the plug thread.

Tool in action



Gasket FinFan Set



Supplied with 20 mm shaft, one set of jaws to suit plug thread diameter, pilot and gasket seat milling head. Plug size details must be provide by customer with order.

Fast Clamping System



Option

System offers rapid tube to tube cycle time, increased productivity (up to 4x) with little operator fatigue. Ideal for large amount of end preps.

Gasket seat facing heads

HEAD TYPE	PLUG SIZE			NEST DIAMETER				INSERT	NO. OF INSERTS REQ'D
	[INCH]	[MM]	TPI	MIN [INCH]	MAX [INCH]	MIN [MM]	MAX [MM]		
FFGSMH-1125	1,125	28,58	12	0,940	1,496	24,00	38,00	CI 5x5	4
FFGSMH-1250	1,250	31,75	12	1,063	1,614	27,00	41,00	CI 5x5	4
FFGSMH-1350	1,375	34,93	12	1,220	1,772	31,00	45,00	CI 5x5	4
FFGSMH-1500	1,500	38,10	12	1,339	1,890	34,00	48,00	CI 5x5	4
FFGSMH-1625	1,625	41,27	12	1,457	2,008	37,00	51,00	CI 5x5	4
FFGSMH-1750	1,750	44,45	12	1,590	2,140	40,40	54,40	CI 5x5	4
FFGSMH-1875	1,875	47,62	12	1,720	2,270	43,60	57,60	CI 5x5	4

Jaws for gasket seat facing

JAWS SET NUMBER	PLUG SIZE		TPI	PILOT
	[INCH]	[MM]		
701MM #36-1-1/8-GFF	1,125	28,575	12	PGFF-1125
703MM #36-1-1/4-GFF	1,250	31,750	12	PGFF-1250
705MM #36-1-3/8-GFF	1,375	34,925	12	PGFF-1350
707MM #36-1-1/2-GFF	1,500	38,100	12	PGFF-1500
709MM #36-1-5/8-GFF	1,625	41,275	12	PGFF-1625
711MM #36-1-3/4-GFF	1,750	44,450	12	PGFF-1750
713MM #36-1-7/8-GFF	1,875	47,625	12	PGFF-1875

Other sizes on request. If plug holes are damaged beyond repair, our MiniDrill

MINIDRILL

FINFAN MACHINING PLATFORM



MiniDrill FinFan is a unique machining platform designed to safely perform the repair or increase the FinFan Cooler plug thread and other operations on heat exchangers, boilers and similar thermal exchange equipment.

Designed with operator safety in mind, this system can drill, ream, bore and even re-machine serrations in steam drums quickly and safely. With a 80 mm (3.150") travel, this tool is ideally suited for the majority of plant equipment.

The system is fully torque reacted with 2 clamping arms that are independent of one another and can accommodate most pitch configurations. Once locked into the tubes, the MiniDrill is extremely stable.



MiniDrill LOCKING PLATE



MiniDrill for FinFan applications is delivered with custom locking plate and 2 reaction shafts. Universal construction of the plate allows for locking machine with both shafts on one side to allow to machine the last holes in the row. Plate can be rotated through 180 degrees to accommodate partition plates, channel heads etc.

MiniDrill DRILLING



Drill for machining holes in tube plugs before removing them with special plug removal tool.

MiniDrill CHAMFERING



Special head for chamfering holes before threading.

MiniDrill THREADING



Tap with manual ratchet handle



TUBE TESTING & PLUGGING

KVLD-3000

VACUUM TUBE TESTING GUN



The vacuum leak tester KVLD-3000 is a simple, precise method of testing tubes in boilers, condensers and heat exchangers. It is the fastest and most accurate means of locating leaky tubes for plugging or replacement.

Powered by compressed air, the vacuum leak detector pulls a vacuum in a tube to a desired reading on a gauge. A steady reading on the gauge would indicate that the tube does not leak. If the reading on the gauge drops, you have pinpointed the leaking tube.



Features

- ▶ Only one tool necessary for testing multiple tube sizes
- ▶ Built-in easy to read vacuum gauge
- ▶ Muffled exhaust for quiet operation
- ▶ Lightweight, easy to use

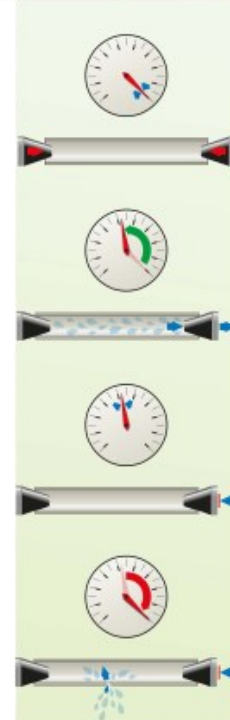
Specifications

- ▶ Cover wide range of tubes with one unit (tube sizes: 1/4" (6.3mm) to 3" (76.2mm))
- ▶ Requires 90PSI (6.2 bar) compressed air
- ▶ Air consumption: 26 C.F.M. (720l/min)
- ▶ Carrying case measures: 16" x 12" x 4" (410 x 300 x 85 mm)
- ▶ Tool weight: 4,4 lbs (1.2 kg)
- ▶ Approximate shipping weight : 6.6 lb (3.0kg)



Operating Instructions

1. Seal far end of tube to be tested with "t" handle type tube plug or optional snap type tube plug
2. Place nozzle of testing into near end of tube
3. Squeeze trigger of test unit until gauge reaches desired reading
4. Release trigger and observe gauge
5. A steady reading on gauge indicates no leaks
6. Move to next tube and repeat



Nozzles Available

Part Number	Tube OD Size
K-1002*	1/4" (6.3mm) - 3/4" (19mm)
K-1003*	5/8" (15.9mm) - 1-1/4" (31.7mm)
K-1004*	1-1/8" (28.6mm) - 2" (50.4mm)
K-1005*	1-7/8" (47.6mm) - 3" (76.2mm)

*Nozzle sold individually. Two are required, one for Gun & one for Stopper.

TP0632

TUBE TESTING GUN



With the Tube Testing System, you can test pneumatically for leaks safe, reliable and fast.

Introducing our pneumatic-driven system, where simplicity meets efficiency. The entire set operates solely on air power, ensuring a hassle-free experience. Simply connect the air inlet tool to the pressure supply, and you're good to go.

For optimal performance, both the air inlet tool and sealing tool must be equipped with the correct seal holders, along with rubber seal and washer sets. These precise components guarantee seamless operation and reliability.

Once the seal holders and rubber seal and washer sets are securely in place, inserting them at both ends of the tube becomes a straightforward task. With this user-friendly setup, you'll be up and running in no time, enjoying the convenience and dependability of our pneumatically-driven solution.



Pictured with extension bar

Using the air inlet tool, air or an inert gas is introduced into the tube, serving two purposes:

- ▶ Firstly, it gently expands the rubber seals, enabling them to securely seal the ends of the tube.
- ▶ Secondly, it gradually builds up pressure within the tube.

Advantages of tube testing system

- ▶ Safe, easy and quick to use thanks to the use of pneumatics and the unique seal
- ▶ Lightweight, ergonomic aluminium housing
- ▶ Seal holders and support rings made of stainless steel
- ▶ System range from 7 to 32 mm
- ▶ Low maintenance costs
- ▶ Perfect addition to the Tube Plugging Gun



Seal Sets TPAN

One set of 2 rubber seals complete with 4 stainless steel support washers to prevent corrosion, to suit one size range.



Seal Holders TPAN

In a standard supply of the IPCO Tube Testing System TP0632, 3 pairs of 2 seal holders are supplied. Each seal holder has its size range and with the 3 the whole range from 7.2 to 32.5mm internal diameter can be covered. The seal holders are made of stainless steel to prevent corrosion.



Seal Holders TP2031

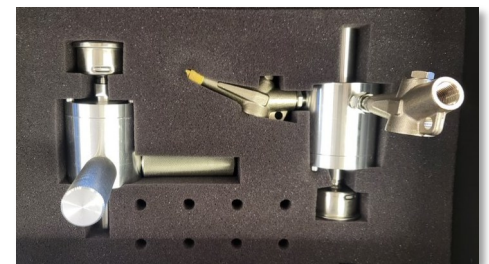
SEAL SET	RANGE ID (MM)
TPAN5107	7,2 - 8,5
TPAN5108	8,2 - 9,5
TPAN5109	9,2 - 10,5
TPAN5110	10,2 - 11,5
TPAN5111	11,2 - 12,5
TPAN5112	12,2 - 13,5

Seal Holders TP2081

SEAL SET	RANGE ID (MM)
TPAN5212	12,2 - 13,5
TPAN5213	13,2 - 14,5
TPAN5214	14,2 - 15,5
TPAN5215	15,2 - 16,5
TPAN5216	16,2 - 17,5
TPAN5217	17,2 - 18,5
TPAN5218	18,2 - 19,5
TPAN5219	19,2 - 20,5
TPAN5220	20,2 - 21,5
TPAN5221	21,2 - 22,5
TPAN5222	22,2 - 23,5
TPAN5223	23,2 - 24,5
TPAN5224	24,2 - 25,5
TPAN5225	25,2 - 26,5
TPAN5226	26,2 - 27,5

Seal Holders TP2101

SEAL SET	RANGE ID (MM)
TPAN5327	27,2 - 28,5
TPAN5328	28,2 - 29,5
TPAN5329	29,2 - 30,5
TPAN5330	30,2 - 31,5
TPAN5331	31,2 - 32,5



IPX1 & IPX4 TUBE PLUGGING GUN



IPX1 & IPX4 PLUG INSTALLATION SET

The installation set consists of a hydraulic ram and hose with an air-driven hydraulic foot pump. The set is supplied in a robust plastic trolley case. The ram is specially designed to install the IPX1 & IPX4 Plugs and a high level of safety was taken into account in this design.

The ram has a robust breakout protection as standard. In the most extreme case, this prevents the pull rod from coming out of the ram. It is possible to remove this breakout protection when working in very small or limited spaces. In addition, the ram always installs the plug in one go. This saves time, prevents human error, improves the performance of the IPX1 & IPX4 Plugs and prevents damage to the tools.



BRUSH SET

Before the tube or tube sheet is safely sealed, the inside must be brushed. The plug brush has been developed for 3 applications:

- ▶ Cleaning, removal of deposits, pitting and oxidation / corrosion
- ▶ Re-rounding the tube or tube sheet hole
- ▶ Roughening the material surface so that the plug gets a good grip.

Two versions of brushes are available: a HT brush for hard materials and a brush for soft materials. The brushes are available in three ways: separately or as a kit within the IPX4 size range. In addition, we supply the brushes as a complete set in a case. Enabling you to always have the correct brush size at hand.



PULL ROD EXTENSION

To install a plug, the complete pull rod is required. If necessary, a pull rod extension can be added. The pull rod extension is used if water boxes, channel heads and/ or baffles are present or with Air Fin Coolers. The extension is connected to the (standard) complete pull rod. The pull rod extension is available as standard in lengths of 300mm. This allows the user to build up the complete system in steps to the desired length.

PLUG REMOVAL TOOL

In rare cases, it may be necessary to remove plugs. For example, if the pipe is insufficiently pre-processed or is cracked/ torn during excessive (post-) rolling. With the plug removal tool, plugs can be removed evenly, quickly and easily. This manual tool consists of one whole piece that makes it strong, robust and durable.



IPX1 SERIES

An IPX1 kit consists of 10 plugs, a brush and a sizing calibre. X1 Plugs are available in the following materials: Carbon steel (C), Brass (B), Duplex (D) and Stainless Steel 316L (S), 304L (E), 321 (ST), 904L (SV), Monel (M), 16Mo3 (A) and Titanium (T). Other materials are available upon request.

Always choose a material similar to the pipe of the heat exchanger! This will prevent chemical and/or thermal reactions between materials.

OPERATING PRESSURE AND TEMPERATURE IPX1

The IPX1 can withstand extremely high working pressures and therefore works in all heat exchangers under the toughest conditions. The maximum working pressure and temperature of the IPX1 depend on the size and material of the plug. If the application sets even higher requirements for the plug than what is already possible by default, we can carry out additional examinations and tests on request to meet your specific requirements.

RANGE(MM)	PLUG	POSITIONER	PULL ROD	PULL ROD EXTENSION	PLUG REMOVAL TOOL
10.0 - 10.5MM	IPK-100-X	IPPP100	IPST-M05	IPSTV-M05	IPVG100-110
10.5 - 11.0MM	IPK-105-X	IPPP105-110			
11.0 - 11.5MM	IPK-110-X				
11.5 - 12.0MM	IPK-115-X	IPPP115-125	IPST-M06	IPSTV-M06	IPVG115-125
12.0 - 12.5MM	IPK-120-X				
12.5 - 13.0MM	IPK-125-X				
13.0 - 13.5MM	IPK-130-X	IPPP130-145	IPST-M08	IPSTV-M08	IPVG130-165
13.5 - 14.0MM	IPK-135-X				
14.0 - 14.5MM	IPK-140-X				
14.5 - 15.0MM	IPK-145-X	IPPP150-165	IPST-M08	IPSTV-M08	IPVG170-245
15.0 - 15.5MM	IPK-150-X				
15.5 - 16.0MM	IPK-155-X				
16.0 - 16.5MM	IPK-160-X	IPPP170-190	IPST-M08	IPSTV-M08	IPVG220-265
16.5 - 17.0MM	IPK-165-X				
17.0 - 17.5MM	IPK-170-X				
17.5 - 18.0MM	IPK-175-X	IPPP195-215	IPST-M08	IPSTV-M08	IPVG220-265
18.0 - 18.5MM	IPK-180-X				
18.5 - 19.0MM	IPK-185-X				
19.0 - 19.5MM	IPK-190-X	IPPP220-240	IPST-M10	IPSTV-M10	IPVG220-265
19.5 - 20.0MM	IPK-195-X				
20.0 - 20.5MM	IPK-200-X				
20.5 - 21.0MM	IPK-205-X	IPPP245-265	IPST-M10	IPSTV-M10	IPVG220-265
21.0 - 21.5MM	IPK-210-X				
21.5 - 22.0MM	IPK-215-X				
22.0 - 22.5MM	IPK-220-X	IPPP220-240	IPST-M10	IPSTV-M10	IPVG220-265
22.5 - 23.0MM	IPK-225-X				
23.0 - 23.5MM	IPK-230-X				
23.5 - 24.0MM	IPK-235-X	IPPP245-265	IPST-M10	IPSTV-M10	IPVG220-265
24.0 - 24.5MM	IPK-240-X				
24.5 - 25.0MM	IPK-245-X				
25.0 - 25.5MM	IPK-250-X	IPPP245-265	IPST-M10	IPSTV-M10	IPVG220-265
25.5 - 26.0MM	IPK-255-X				
26.0 - 26.5MM	IPK-260-X				
26.5 - 27.0MM	IPK-265-X				

IPX4 SERIES

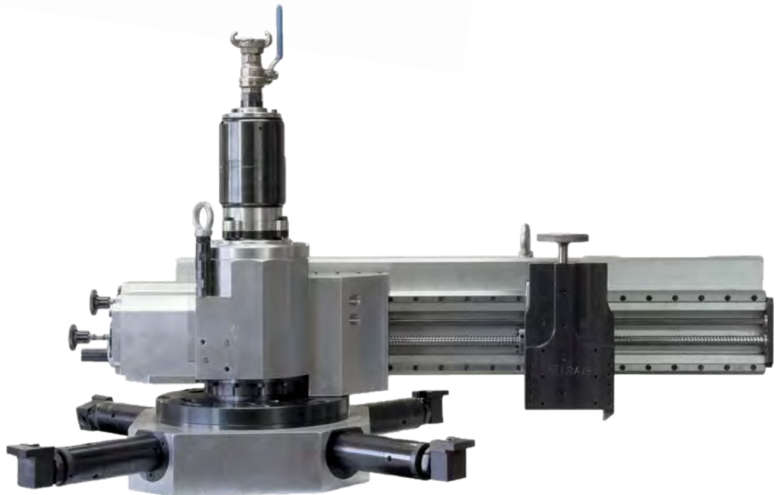
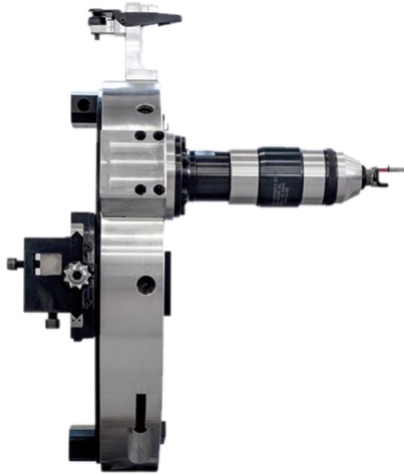
An IPX4 kit consists of 10 plugs and a sizing calibre. The X4 plugs have a standard operating pressure (Ps) of 100 bar and a much larger range than the X1. The advantage of the larger range is that less stock is needed and that ordering the correct size is easier.

X4 Plugs are available in the following materials: Carbon steel (C), Brass (B), Monel (M), and Stainless Steel 316L (S) 304L (E), 321 (ST), 904L (SV). Other materials are available upon request. Always use a material similar to the material of the pipe and pipe plate to prevent thermal and/or chemical reactions between different materials.

OPERATING PRESSURE AND TEMPERATURE IPX4

While the working pressure of the X4 is 100 bar, the temperature of the IPX4 remains dependent on the material of the plug. If the application sets even higher requirements for the plug than what is already possible by default, we can carry out additional examinations and tests on request to meet your specifications.

RANGE(MM)	PLUG	POSITIONER	PULL ROD	PULL ROD EXTENSION	PLUG REMOVAL TOOL
13.5 - 14.5MM	IPPX4_135	IPX4-PPB135-145	IPST-M06	IPSTV-M06-300	IPVGX4-135-175
14.5 - 16.5MM	IPPX4_145	IPX4-PPB145-160			
15.5 - 17.0MM	IPPX4_155	IPX4-PPB155-170			
17.0 - 19.5MM	IPPX4_170	IPX4-PPB170-195	IPST-M08	IPSTV-M08-300	IPVGX4-170-195
19.5 - 22.0MM	IPPX4_195	IPX4-PPB195-220			
21.5 - 24.0MM	IPPX4_215	IPX4-PPB215-240			
24.0 - 26.5MM	IPPX4_240	IPX4-PPB240-265	IPST-M10	IPSTV-M10-300	IPVGX4-240-265
26.5 - 29.0MM	IPPX4_265	IPX4-PPB265-290			
29.0 - 31.5MM	IPPX4_290	IPX4-PPB290-315			
31.5 - 34.0MM	IPPX4_315	IPX4-PPB315-340	IPST-M10	IPSTV-M10-300	IPVGX4-290-315
34.0 - 36.5MM	IPPX4_340	IPX4-PPB340-365			
36.5 - 39.0MM	IPPX4_365	IPX4-PPB365-390			
39.0 - 41.5MM	IPPX4_390	IPX4-PPB390-415	IPST-M10	IPSTV-M10-300	IPVGX4-315-340
41.5 - 44.0MM	IPPX4_415	IPX4-PPB415-440			



FLANGE MANAGEMENT

MANUAL FLANGE FACER

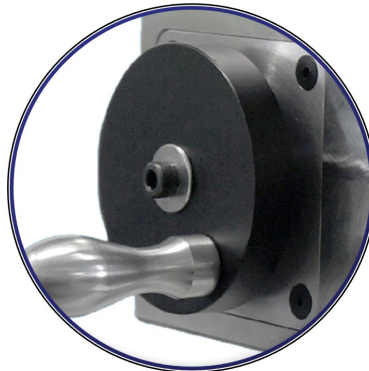
1.25" - 14" MANUAL FLANGE MILL



The **MFM Manual Flange Mill** is a simple and cost-effective solution for ID mount flange facing. It is a quick and easy way to recondition damaged or worn flange gasket seats to like-new condition on site.

It is designed and built to allow quick and convenient processing of small flanges in awkward locations and produces a precise phonographic finish.

Being hand operated, without the need for any form of power supply, it is ideal for hazardous areas or remote locations.



MODEL	CLAMPING RANGE		FACING RANGE		TOOL TRAVEL	MAX SWING DIAMETER
Manual Flange Mill	25.4mm	254.0mm	30mm	350mm	V: 10mm H: 55mm	457.2mm
	1"	10"	1.25"	14"	V: 0.395" H: 2.165"	18"

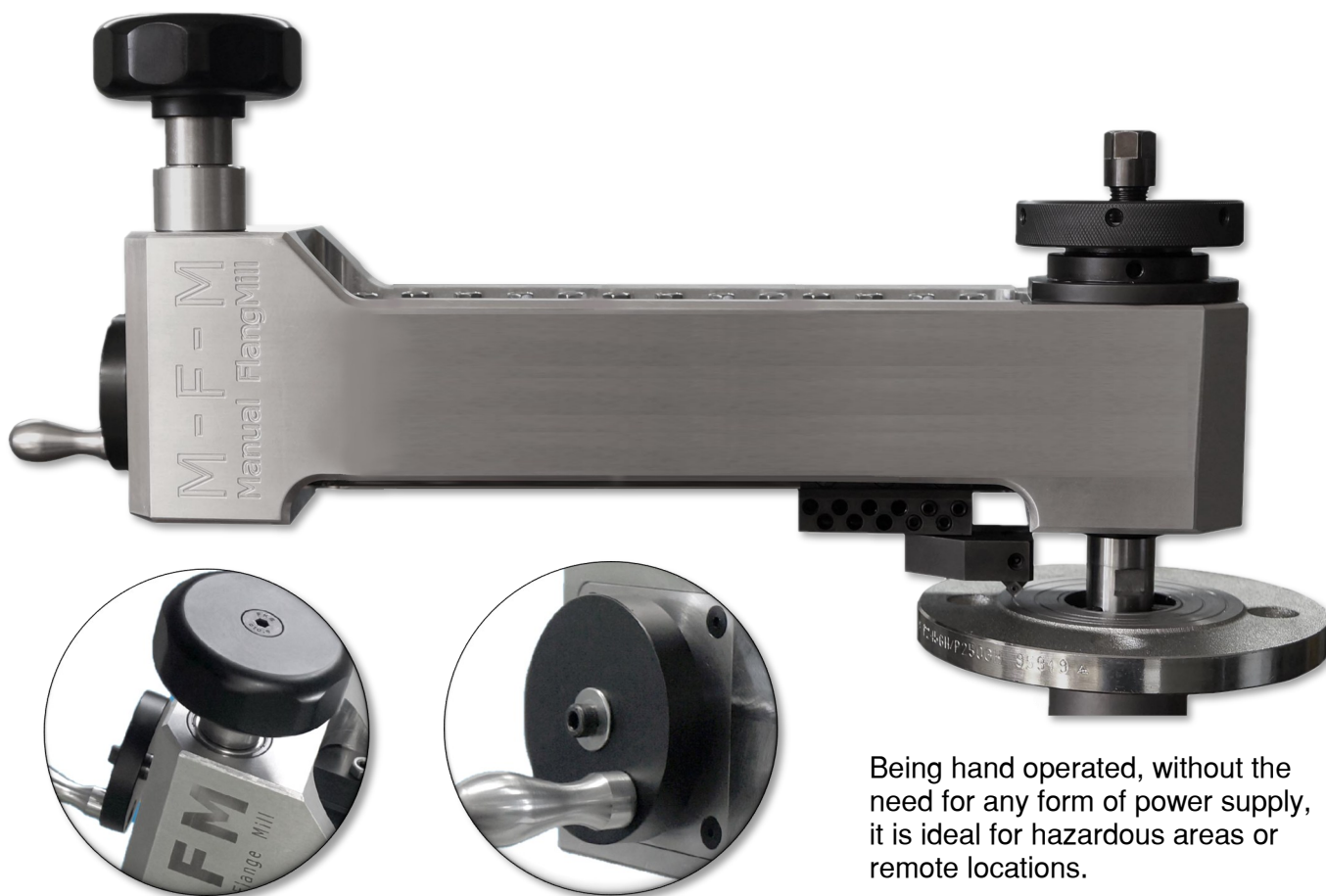


MANUAL FLANGE FACER

2" - 25" MANUAL FLANGE MILL



The **MFM-L Manual Flange Mill** is a simple and cost-effective solution for ID mount flange facing. It is a quick and easy way to recondition damaged or worn flange gasket seats to like-new condition on site. It is designed and built to allow quick and convenient processing of small flanges in awkward locations and produces a precise phonographic finish.



Being hand operated, without the need for any form of power supply, it is ideal for hazardous areas or remote locations.

MODEL	CLAMPING RANGE		FACING RANGE		TOOL TRAVEL	MAX SWING DIAMETER
Manual Flange Mill	50mm	550mm	50mm	650mm	V: 10mm H: 55mm	757mm
	2"	21.6"	2"	25"	V: 0,395" H: 2,165"	30"



ID MOUNTED FLANGE FACER

MMFM - MINI FLANGE FACER



Compact and light weight flange milling machine - one of the most compact designs on the market today.

- ▶ Low clearance
- ▶ Flat and raised face flanges
- ▶ Single line, true gramophone groove with 50 grooves per inch to comply with ASME B46.1 code
- ▶ Pneumatic drive 1,3Hp or 750W electric with planetary gear box
- ▶ Stainless steel body to stiffen the machine base
- ▶ Rigid construction aluminium facing head, supported by multiple bearings
- ▶ Solid locking mandrel shaft and rigid mounting jaw set
- ▶ Hardened and ground tool slides for precision



Quality Components

- ▶ Pneumatic motor comes with filter, lubricator and flow control.
- ▶ Compact, low-profile drive system engineered for superior power to weight ratio.
- ▶ Features rugged main body, heavy-duty bearings, sealed lubrication and rigid mounting system.

Optional feed screw

Optional feed screw/nut are available with 69 and 101 grooves per inch.

Convenient scale
Easy to read gauge in metric and imperial scale

Facing Range		Range Pipe Facing (Single Point)		Locking Range		Vertical Feed Stroke		Machine Feed Rate		Power	
37-254mm		51-254mm		26-150mm		13mm		0.5mm		1.3Hp	
1.45-10"		2-10" OD		1.0-5.9"		0.5"		0.019"			
Air Use		Weight		Height		Length		Swing Diameter			
55 cfm	1.3m ³ /min	23 Lbs	10.43kg	19.291"	490mm	16.338"	415mm	12.2"	310mm		



ID MOUNTED FLANGE FACER

IMFM-24 - FLANGE FACER

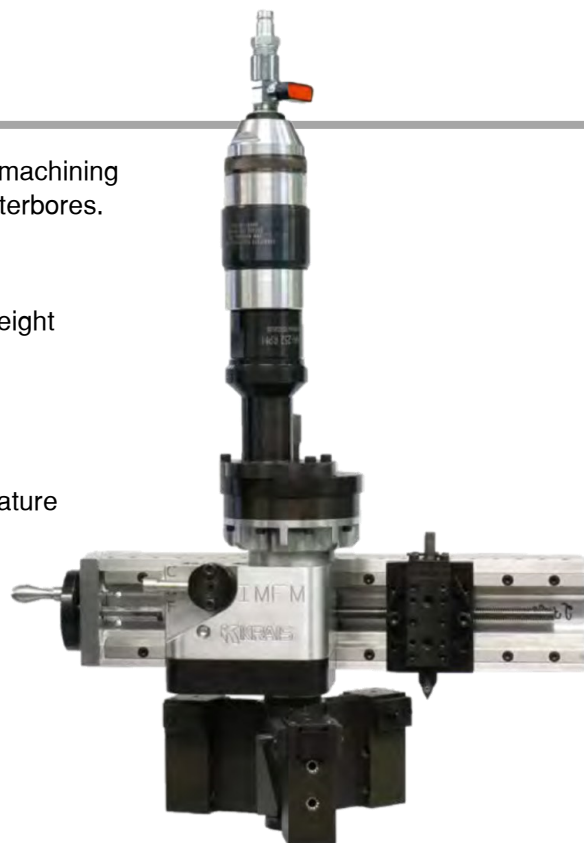


Internally mounted, lightweight and durable machine tool. Ideal for machining all types of flange faces, seal grooves, weld preparations and counterbores.

- ▶ Heavy-duty steel/aluminium design
- ▶ High rigidity of the machine in relation to the dimension and weight
- ▶ Solid but lightweight construction
- ▶ Continuous groove facing feeds
- ▶ Swivel tool post for grooves, RTJ flanges and bevels
- ▶ Easy levelling and centering system with built-in fast centre feature
- ▶ Quick clamping with solid 50mm self-centering steel shaft
- ▶ CE certified

As standard, the IMFM24 is supplied with a complete tool kit, including tool and inserts, air filter with lubricator and hose connection, required jaws to cover the full range, paper manual and storage/shipping box.

Beside standard pneumatic 2.2Hp drive, we offer a wide range of pneumatic and electric drives for the IMFM24.



Standard Working Range		Facing Feeds			Free Speed	Power
Facing Range	Locking range	1.75mm Screw	1.25mm Screw	1.00mm Screw		
100-610mm	100-508mm	0.2 / 0.8mm	0.14 / 0.57mm	0.15 / 0.45mm	20-42 Rpm	2.2 Hp
4-24.0"	4-20.0"	0.008 / 0.031"	0.006 / 0.022"	0.004 / 0.018"		1.6 Kw

Air Use		Weight		Body Height	Body Length
75 cfm	2.2m ³ /min	99 Lbs	45kg	<i>Depends on motor configuration, see drawing below</i>	

Levelling and Centering

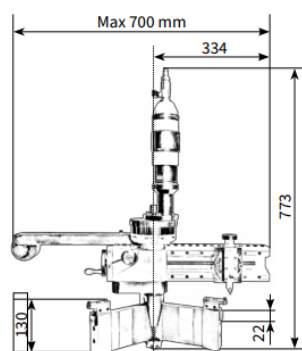


Special jaw set for levelling and centering on a flange

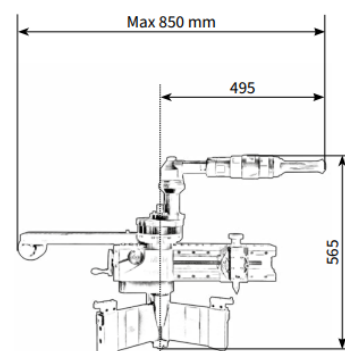
Tooling Chart

Holder	IMFM24-V11
Insert	CIV-11-3-1
Screw	MHS-4
Torx	TX-15

Inline



Rightangle



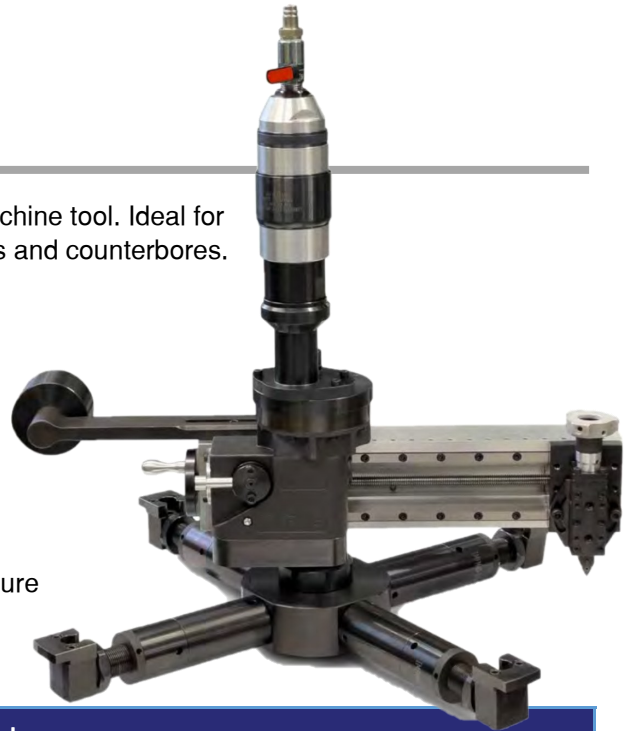
ID MOUNTED FLANGE FACER

IMFM-30 - FLANGE FACER



Internally mounted, lightweight super rigid yet super heavy-duty machine tool. Ideal for machining all types of flange faces, seal grooves, weld preparations and counterbores.

- ▶ Heavy-duty steel/aluminium design
- ▶ Heavy-duty cast steel body and steel body plate
- ▶ Solid construction and high rigidity of the machine in relation to the dimension and weight
- ▶ Continuous groove facing feed, 2-speed gearbox
- ▶ Swivel tool post for grooves, RTJ flanges and bevels
- ▶ Easy levelling and centring system with built-in fast centre feature
- ▶ Quick clamping with solid 50mm self-centring steel shaft
- ▶ CE certified



Standard Working Range		Facing Feeds			Free Speed	Power
Facing Range	Locking range	1.75mm Screw	1.25mm Screw	1.00mm Screw		
145-762mm	140-670mm	0.2 / 0.8mm	0.14 / 0.57mm	0.15 / 0.45mm	20-42 Rpm	2.2 Hp
5-30.0"	5.5-26.0"	0.008 / 0.031"	0.006 / 0.022"	0.004 / 0.018"		1.6 Kw

Air Use		Machine Weight		Body Height		Body Length	
75 cfm	2.2m ³ /min	108 Lbs	49kg	<i>Depends on motor configuration, see drawing below</i>			

Complete Package

As standard, the IMFM-30 is supplied with a complete toolkit, including tool and inserts, air filter with lubricator and hose connection, required jaws to cover the full range, paper manual and storage/shipping box. Beside standard pneumatic 2.2Hp drive, we offer a wide range of pneumatic and electric drives for the IMFM-30.

Tooling Chart

Holder	Insert	Screw	Torx
IMFM24-V11	CIV-11-3-1	MHS-4	TX-15

Wide Range

Machine is equipped with 2 locking bases.
 Small base - 140-290mm
 Big base - 250-700mm



Unique Rigidity

High rigidity of the machine in relation to the dimension and weight by applying Heavy-duty cast steel body and steel body plate.



Swivel Tool

Swivel tool post for grooves, RTJ flanges and bevels



Convenient Jaws

Special jaw set for easy and quick levelling and centring machine. A special mechanism allows convenient adjustment of the mounting plane relative to the pipe. Jaws are interchangeable and all IMFM series flange facers.

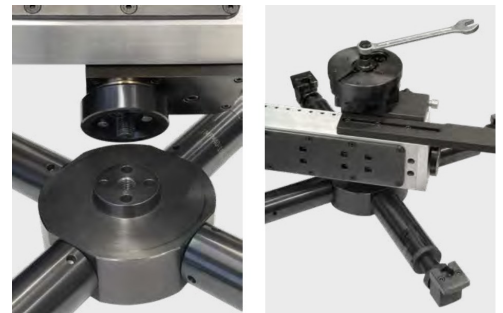


Precise mounting



Fast Fixing

Super fast machine fixing with locking base by means of taper in the locking base and taper seat in the spindle, fastened with a central locking screw.



Fast mounted arm with spindle for convenient measuring of levelling and centring.

Right Angle Head



This optional addon allows for fastening drive in alternate positions. A useful option in tight spaces.

Electric Drive

As an option, we can deliver the electric motor, made by Makita. With our 3 stage planetary gear box, the drive has variable speed control and produces enormous torque. It is interchangeable with pneumatic drive and can be purchased separately at any time.

Also available with battery driven motor!

- ▶ Free Speed - 115 Rpm
- ▶ Power - 750 W
- ▶ Torque - 360 Nm (266 Ft. Lbs)



ID MOUNTED FLANGE FACER

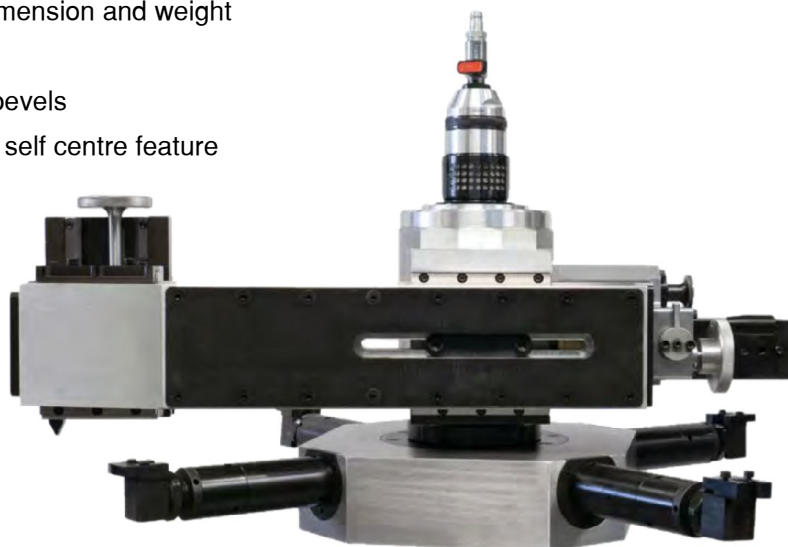
IMFM-40 - FLANGE FACER



Internally mounted, lightweight and durable machine tool. Ideal for machining all types of flange faces, seal grooves, weld preparations and counterbores.

- ▶ Heavy-duty steel/aluminium design with solid but lightweight construction
- ▶ High rigidity of the machine in relation to the dimension and weight
- ▶ Continuous groove facing feeds
- ▶ Swivel tool post for grooves, RTJ flanges and bevels
- ▶ Easy levelling and centring system with built-in self centre feature
- ▶ Quick clamping with solid 50mm self-centring steel shaft
- ▶ CE certified

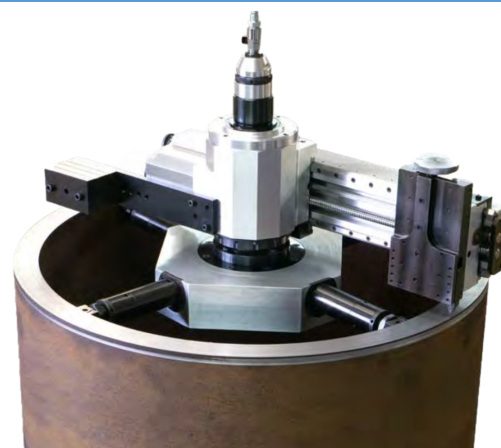
As standard, the IMFM-40 is supplied with a complete toolkit, including tool and inserts, air filter with lubricator and hose connection, required jaws to cover the full range, paper manual and storage/shipping box. Beside standard pneumatic 2.2Hp drive, we offer a wide range of pneumatic and electric drives for the IMFM-40.



Standard Working Range		Max Swing Diameter	Tool Post Travel	Feed Rates	Free Speed	Power
Facing Range	Locking range					
152-1016mm	120-820mm	813mm	102mm	See table	0-24 Rpm	2.2 Hp
6-39.7"	4.72-32.20"	32"	4"			1.6 Kw

Air Use		Shipping Width		Shipping Height		Shipping Length		Body Weight		Shipping Weight	
75 cfm	2.2m ³ /min	600mm	24"	725mm	28.5"	845mm	34"	145 Kg	319 Lbs	210 Kg	462 Lbs

Direction	Gear	mm/rev	Inch/rev	Grooves per cm	Grooves per inch
Out	1	0.139	0.005	72	183
	2	0.217	0.009	46	1177
	3	0.528	0.021	19	48
In	1	0.165	0.006	61	154
	2	0.258	0.010	39	98
	3	0.628	0.025	16	40



Levelling and Centring



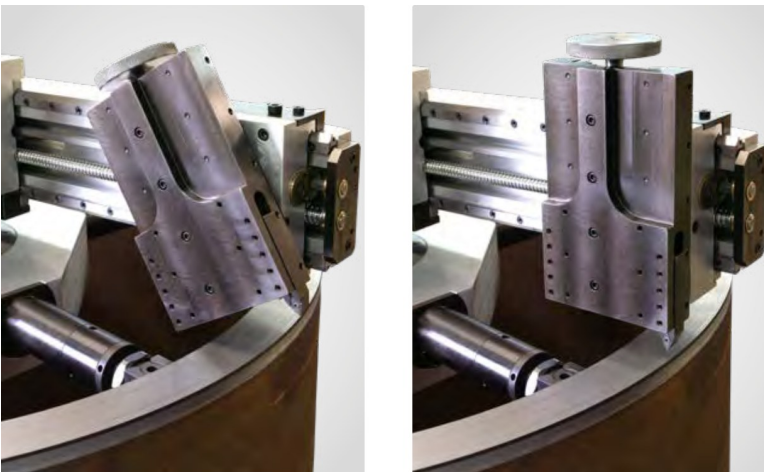
Both machines are equipped with a special jaw set for easy and quick levelling and centring. A special mechanism allows convenient adjustment of the mounting plane relative to the pipe. The built-in self-centring locking system significantly facilitates the coarse setting of the machine.

Electric Drive



As an alternative, we offer an electric drive for the IMFM-40 and IMFM-60. This electric motor provides similar parameter to the pneumatic version.

Swivel Tool as Standard



Boring Feed Rates (3 off - Up/Down)

mm/rev			Inches/rev		
0.05	0.10	0.20	0.002	0.004	0.0088

Tooling Chart

Holder	Insert	Screw	Torx
IMFM40F-V11	CIV-11-3-1	MHS-4	TX-15
IMFM40P-V11	CIV-11-3-1	MHS-4	TX-15
IMFM40L-V11	CIV-11-3-1	MHS-4	TX-15

Two Locking Plates



The IMFM-40 includes two sizes of locking system. Thanks to the matching dimensions of the rigid body, stable mounting and smooth machining of face surfaces and flanges in all pipe sizes is possible.



ID MOUNTED FLANGE FACER

IMFM-60 - FLANGE FACER



Internally mounted, lightweight and durable machine tool. Ideal for machining all types of flange faces, seal grooves, weld preparations and counterbores.

- ▶ Heavy-duty steel/aluminium design with solid but lightweight construction
- ▶ High rigidity of the machine in relation to the dimension and weight
- ▶ Continuous groove facing feeds
- ▶ Swivel tool post for grooves, RTJ flanges and bevels
- ▶ Easy levelling and centring system with built-in self centre feature
- ▶ Quick clamping with solid 50mm self-centering steel shaft
- ▶ CE certified



As standard, the IMFM-60 is supplied with a complete toolkit, including tool and inserts, air filter with lubricator and hose connection, required jaws to cover the full range, paper manual and storage/shipping box. Beside standard pneumatic 4.0Hp drive, we offer a wide range of pneumatic and electric drives for the IMFM-60.

Standard Working Range		Max Swing Diameter	Tool Post Travel	Feed Rates	Free Speed	Power
Facing Range	Locking range					
305-1525mm	290-1400mm	765mm	102mm	See table	0-22 Rpm	4.0 Hp
12-60"	11.4-55"	30.1"	4"			3.0 Kw

Air Use		Shipping Width		Shipping Height		Shipping Length		Body Weight		Shipping Weight	
98 cfm	2.7m ³ /min	820mm	32"	830mm	33"	1230mm	48"	412 Kg	906 Lbs	499 Kg	1010 Lbs

Direction	Gear	mm/rev	Inch/rev	Grooves per cm	Grooves per inch
Out	1	0.130	0.005	76	195
	2	0.203	0.008	49	125
	3	0.494	0.019	20	51
In	1	0.155	0.006	65	164
	2	0.241	0.009	41	105
	3	0.588	0.023	17	43



Levelling and Centring



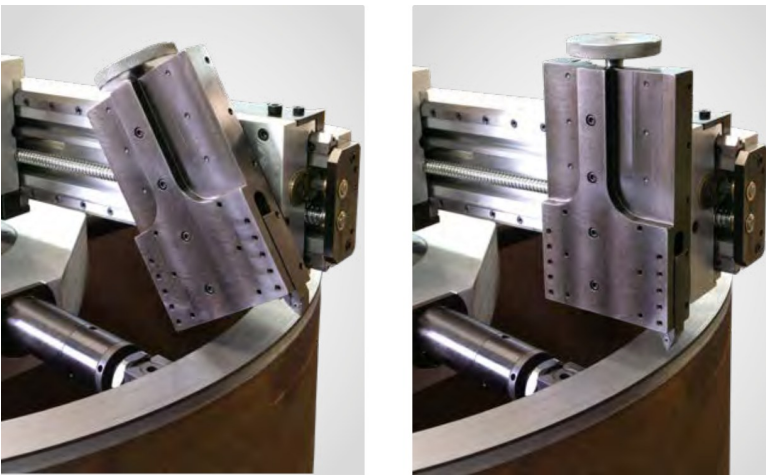
Both machines are equipped with a special jaw set for easy and quick levelling and centring. A special mechanism allows convenient adjustment of the mounting plane relative to the pipe. The built-in self-centring locking system significantly facilitates the coarse setting of the machine.

Electric Drive



As an alternative, we offer an electric drive for the IMFM-40 and IMFM-60. This electric motor provides similar parameter to the pneumatic version.

Swivel Tool as Standard



Boring Feed Rates (3 off - Up/Down)

mm/rev			Inches/rev		
0.05	0.10	0.20	0.002	0.004	0.0088

Tooling Chart

Holder	Insert	Screw	Torx
IMFM60F-V11	CIV-11-3-1	MHS-4	TX-15
IMFM60P-V11	CIV-11-3-1	MHS-4	TX-15
IMFM60L-V11	CIV-11-3-1	MHS-4	TX-15

Two Locking Plates



The IMFM-60 includes two sizes of locking system. Thanks to the matching dimensions of the rigid body, stable mounting and smooth machining of face surfaces and flanges in all pipe sizes is possible.



FLANGE SPREADER

MANUAL FLANGE SPREADER



Flange spreaders are used in many industrial applications; Chemical, Petroleum, North Sea Oil and Food Processing for example. There is also a wide application on board ships. In fact they find use in any environment that requires Safety, Speed and Reliability.

Further benefits are their ease of use and low spark risk.

Strongly constructed these tools are available in a range of sizes, and the option of special versions manufactured to order.

- ▶ Split and support the flange in one tool
- ▶ Low spark risk compared with more manual methods
- ▶ Powder coated with high tensile bolt and wedge
- ▶ Ultra reliable
- ▶ Lightweight



Part No.	Type	Bolt Diameter	Spread	Weight	Nominal Pipe Size
25.0001	1	5/8" (16mm)	2-3/4" (70mm)	5 lbs (2.27Kg)	Up to 4"
25.0002	2	3/4" (19mm)	3-3/4" (95mm)	6 lbs (2.73Kg)	6" or 8"
25.0003	3	7/8" (22mm)	4-7/8" (124mm)	9 lbs (4.10Kg)	10" or 12"
25.0004	4	1" (25mm)	6-1/8" (155mm)	14 lbs (8.18Kg)	14" or 16"
25.0005	5	1-1/8" (28mm)	7-1/8" (181mm)	18 lbs (8.18Kg)	18"
25.0006	6	1-1/4" (31mm)	9-1/8" (231mm)	21 lbs (9.55Kg)	Over 18"



HYDRAULIC FLANGE SPREADER

RENQUIP FSW17P

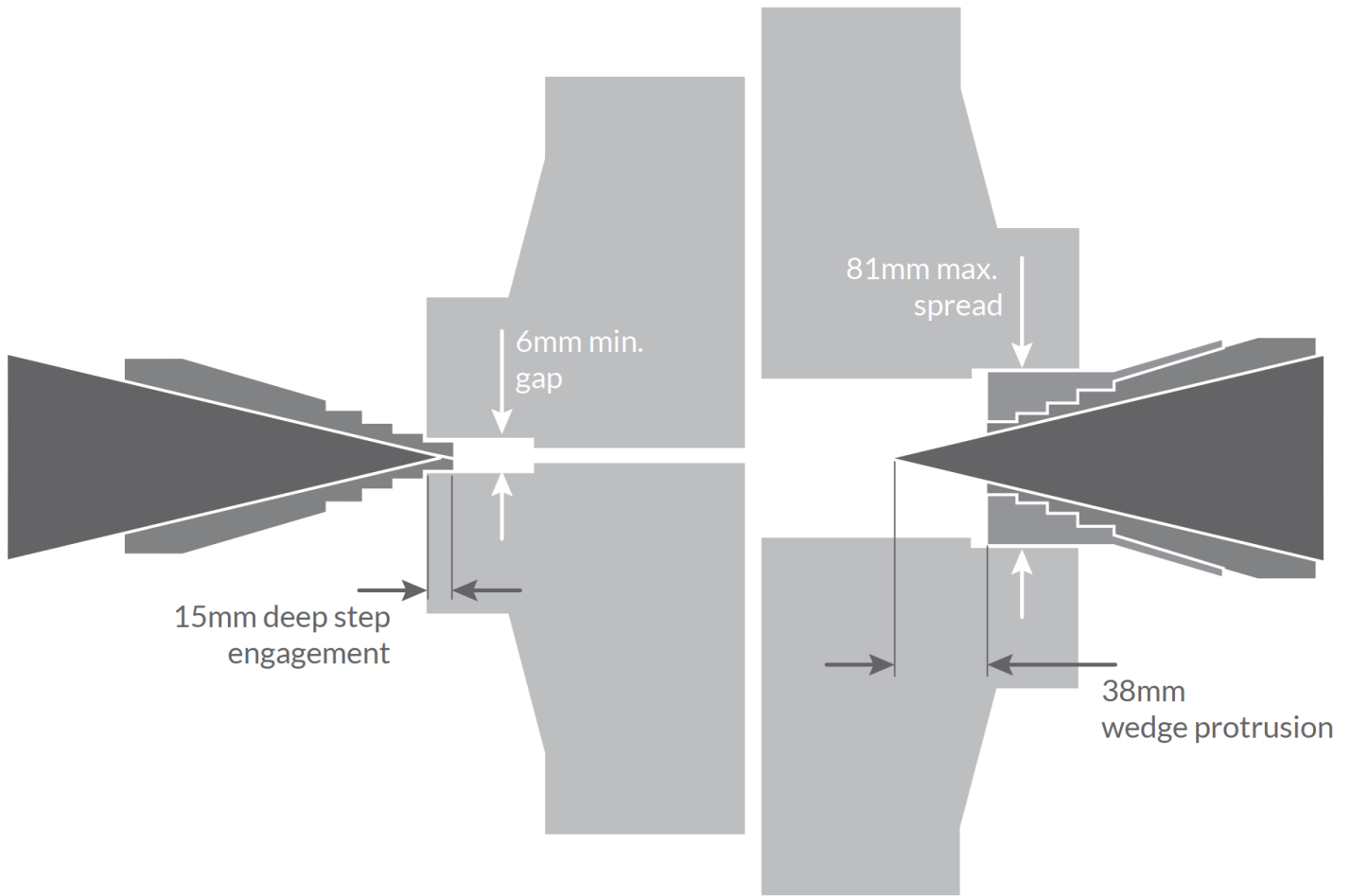


A Hydraulic Flange Spreading Wedge with a combined hydraulic cylinder and pump unit.

The FSW17P flange spreading wedge can enter a flange joint access gap as small as 6mm and produce a maximum force of 326kN when used in pairs (as recommended) to push the mating faces of flanges apart. The FSW17P can create a gap up to 81mm between flange faces with the stepped blocks fitted facilitating the replacement of gaskets, seal rings, or other flange face maintenance and testing.

- ▶ **100% load/pressure tested and certified**
- ▶ **High durability, high quality and low maintenance design**
- ▶ **Tool weight 8.5Kg**
- ▶ **Max spreading force 163kN (326kN when used in pairs)**
- ▶ **Spreading distance 6mm to 81mm when used with stepped blocks**
- ▶ **Robust moulded case** for easy transportation and storage





Kit weight	13Kg
Kit dims	580mm x 340mm x 180mm
Tool weight	8.5Kg
Tool dims	76mm x 155mm x 440mm
Product ordering code	25.FSW17P

Kit Content

- 1 x FSW17P Tool with combined hydraulic cylinder and pump unit
- 1 x Pump Actuating Handle
- 1 x Safety Block
- 1 x Safety Lanyard
- 2 x Stepped Blocks with securing screws and allen key
- 1 x Instruction Manual
- 1 x Robust moulded carry case

CLAMSHELLS

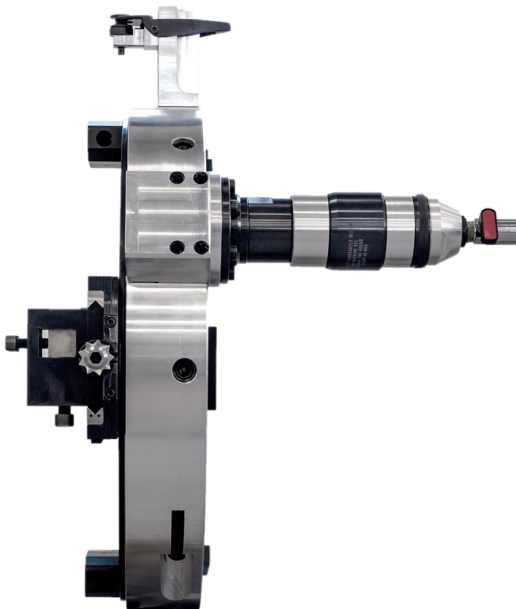
SPLIT FRAME CLAMSHELLS



Our Range of clamshells are low clearance, split frame cutting and bevelling machines designed for cutting and bevelling pipe efficiently. They can operate on many materials including carbon steel, stainless steel, Hastelloy, Incoloy and Super Duplex.

Split Frame Clamshell Cutters

- ▶ Our standard models cover a range from 1-3/8" (33.4mm) to a 48" (1219mm) OD
- ▶ Our power options are **Pneumatic**, **Hydraulic** and **Electric** drive
- ▶ Different drive options are available to suit different machining applications
- ▶ Slim Fit Clamshells can be used to cut/part-off, bevel, face and counterbore



Machines are supplied with:

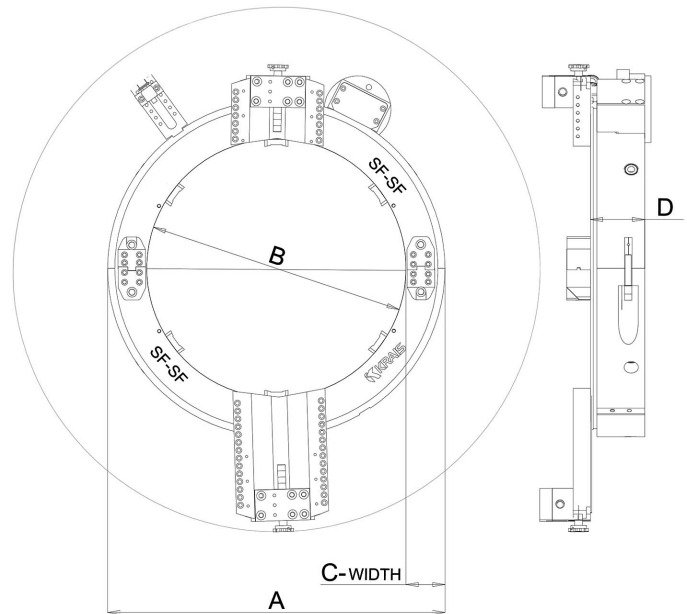
- ▶ 1 off split hard drive ring, gearbox and drive motor.
- ▶ 2 off combination tool slides for cutting & bevelling.
- ▶ Striker feed unit with adjustable cut feature.
- ▶ Integral clamping unit and spacers.
- ▶ Toolkit.
- ▶ Storage / shipping box.

Contact us with your exact requirement and we'll get you specifications of a machine to suit.

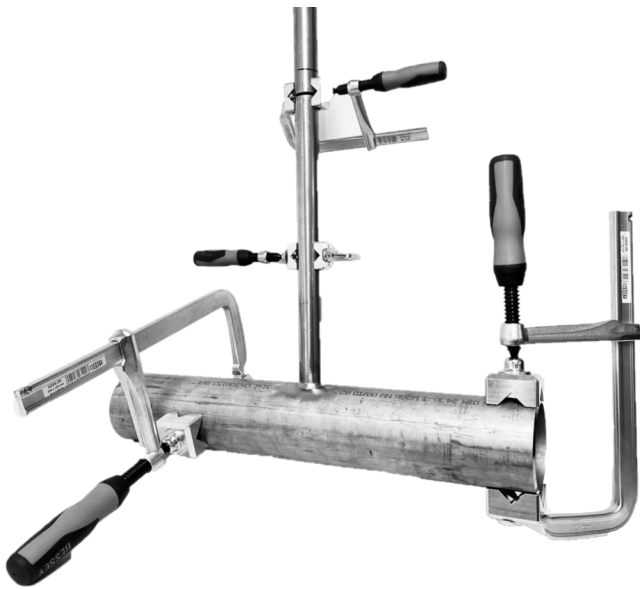
Models and Capacity

The SLIM FIT Clamshell series are designed for strength and easy handling. Each of the machine from the SFSF series have a height of 3,248" (82,5 mm) up 24" and 4,47" (113,7 mm) up to 48" and a width of 2.5" (63,5 mm) resulting narrow body low profile design that makes the SFSF series the ideal choice in tight spaces.

See table with technical machine information to make the right choice to suit your application.



Model	Pipe Capacity				Dimensions							Locator Pads	Gear Ring Ratio
	Unit	Min OD	Max OD	Unit	A	B	C	D	1" Slide Swing	3" Slide Swing	6" Slide Swing		
SFSF-0204	NPS	2,00	4,00	[inch]	9,68	4,73	2,50	3,248	12,16	16,165	-	4	4,6:1
	Metric	60,32	127,00	[mm]	246,00	120,30	63,50	82,50	309,00	410,60	-		
SFSF-0256	NPS	2,50	6,00	[inch]	11,83	6,85	2,50	3,248	14,33	18,339	-	4	5,7:1
	Metric	73,02	168,27	[mm]	300,50	174,20	63,50	82,50	364,20	465,80	-		
SFSF-0358	NPS	3,50	8,00	[inch]	13,81	8,84	2,50	3,248	16,33	20,33	26,33	4	6,7:1
	Metric	101,60	219,07	[mm]	351,00	224,70	63,50	82,50	415,00	516,60	669,00		
SFSF-0410	NPS	4,50	10,00	[inch]	16,22	11,23	2,50	3,248	18,75	22,75	28,75	4	7,8:1
	Metric	127,00	273,05	[mm]	412,00	285,40	63,50	82,50	476,40	578,00	730,40		
SFSF-0612	NPS	6,00	12,00	[inch]	18,15	13,23	2,50	3,248	20,84	24,84	30,84	4	8,9:1
	Metric	168,27	323,85	[mm]	461,00	336,20	63,50	82,50	529,40	631,00	783,40		
SFSF-0814	NPS	8,00	14,00	[inch]	19,48	14,48	2,50	3,248	22,06	26,06	32,06	6	9,5:1
	Metric	219,07	355,60	[mm]	495,00	367,90	63,50	82,50	560,40	662,00	814,40		
SFSF-1016	NPS	10,00	16,00	[inch]	21,45	16,48	2,50	3,287	24,10	28,102	34,10	6	10,6:1
	Metric	273,05	406,40	[mm]	545,00	418,70	63,50	83,50	612,20	713,80	866,20		
SFSF-1218	NPS	12,00	18,00	[inch]	23,50	18,48	2,50	3,287	26,22	30,22	36,22	6	11,6:1
	Metric	323,85	457,20	[mm]	597,00	469,50	63,50	83,50	666,10	767,70	920,10		
SFSF-1420	NPS	14,00	20,00	[inch]	25,47	20,84	2,50	3,287	28,15	32,15	38,15	6	12,6:1
	Metric	355,60	508,00	[mm]	647,00	520,30	63,50	83,50	715,00	816,60	969,00		
SFSF-1624	NPS	16,00	24,00	[inch]	29,48	24,40	2,50	3,287	32,26	36,26	42,26	10	14,6:1
	Metric	406,40	609,60	[mm]	749,00	619,90	63,50	83,50	819,60	921,20	1073,60		
SFSF-2028	NPS	20,00	28,00	[inch]	33,90	28,75	2,75	4,476	36,51	40,51	46,51	10	16,9:1
	Metric	508,00	711,20	[mm]	861,10	730,30	65,40	113,70	927,50	1029,10	1181,50		
SFSF-2432	NPS	24,00	32,00	[inch]	38,15	33,00	2,75	4,476	40,78	44,78	50,78	10	19:01
	Metric	609,60	812,80	[mm]	969,00	838,20	65,40	113,70	1036,00	1137,60	1290,00		
SFSF-2836	NPS	28,00	36,00	[inch]	42,150	37,000	2,75	4,476	44,91	48,91	54,91	10	21:01
	Metric	711,20	914,40	[mm]	1070,60	939,80	65,40	113,70	1140,80	1242,40	1394,80		
SFSF-3442	NPS	34,00	42,00	[inch]	48,15	43,00	2,75	4,476	50,90	54,90	60,90	10	24,2:1
	Metric	863,60	1066,80	[mm]	1223,00	1092,20	65,40	113,70	1293,00	1394,60	1547,00		
SFSF-4048	NPS	40,00	48,00	[inch]	54,40	49,52	2,75	4,476	57,27	61,27	67,27	12	27,3:1
	Metric	1016,00	1219,20	[mm]	1381,80	1251,00	65,40	113,70	1454,80	1556,40	1708,80		



ANCILLARIES

PIPE CLAMPS

BLACK BRIDGE CLAMPS



The Black Bridge Pipe Clamps can be used in the welding of all kinds of materials such as carbon steel, stainless, duplex, super duplex, and titanium. Due to its design, the Black Bridge Clamp ensures that the clamping forces are evenly spread around the pipe to be welded. This is true for all pipe dimensions within the range of the BB Clamp. The adjusting screws have stainless steel bearings, thus reducing the risk of carbon contamination and corrosion. The arms are fabricated from steel which allows a clamping force to meet the requirements for all pipe dimensions within the range of the Clamp. The welding of pipe to pipe and pipe to fittings is easily performed with BB Clamp. Three sizes of clamp are available covering all pipe diameters between 1" - 14".



Features

- ▶ Quick and easy to use
- ▶ Combines accuracy with safety
- ▶ Instant centring
- ▶ A quality product at low cost
- ▶ Wing bolts with stainless steel bearings

Part No.	Pipe Diameter Imperial	Pipe Diameter Metric	Weight KG/LBS
BBC2	1"-2"	25-65mm	1.5 / 3.50
BBC6	2"-6"	50-168mm	3.75 / 8.0
BBC12	5"-12"	127-325mm	7.50 / 15.0



PIPE CLAMPS

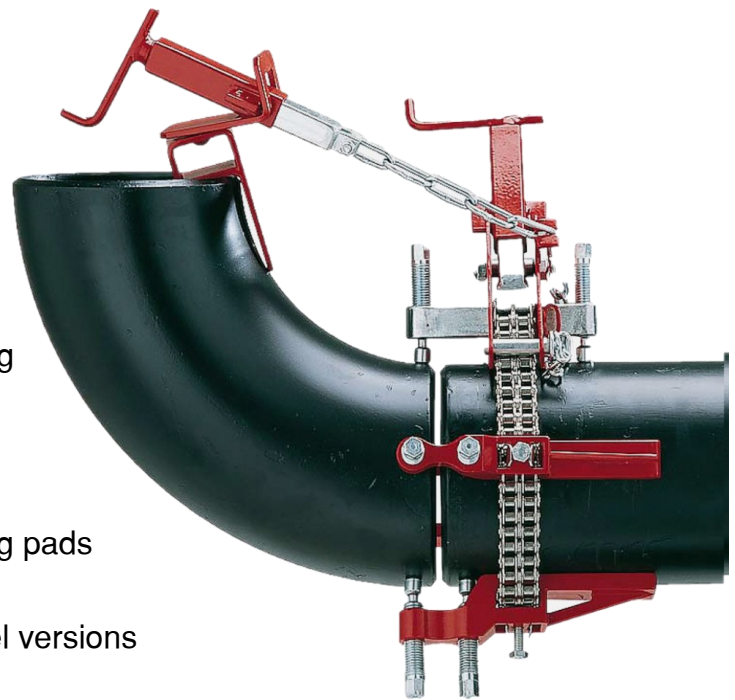
CHAIN CLAMPS



The Chain Clamp is a Double Jackscrew clamp for aligning and reforming pipes up to 54" diameter. Supplied in a metal storage box, each clamp comes with the length of chain required for the given pipe range and double jackscrew jackbars for clamping and aligning. A fitting alignment device is also included for the positioning of tees and elbows. A range of double chain clamps is also available for ultra heavy duty applications, please enquire.

Key Features

- ▶ Can align all pipe schedules accurately
- ▶ Jackscrews enable elimination of Hi-Lo points either side of the joint.
- ▶ Can re-form up to schedule 40 pipes
- ▶ Joints can be fully welded without removing the clamp
- ▶ Elbows, Tees and other fitting can be accurately aligned
- ▶ Jackbars have two jackscrews with pivoting pads to compensate for uneven surfaces
- ▶ Available in both **Carbon & Stainless** steel versions



Part No.	Pipe Diameter	No. of Jackbars	Reformed Pipe	Aligns Pipe to	Shipping Wt Kgs
SCC8	1"-8"	3	40	80	12
SCC8SS	1"-8"	3	40	80	12
SCC20	4"-20"	7	40	80	33
SCC20SS	4"-20"	7	40	80	33
SCC36	10"-36"	8	40	80	67
SCC36SS	10"-36"	8	40	80	67
SCC54	10"-54"	13	40	80	82
SCC54SS	10"-54"	13	40	80	82

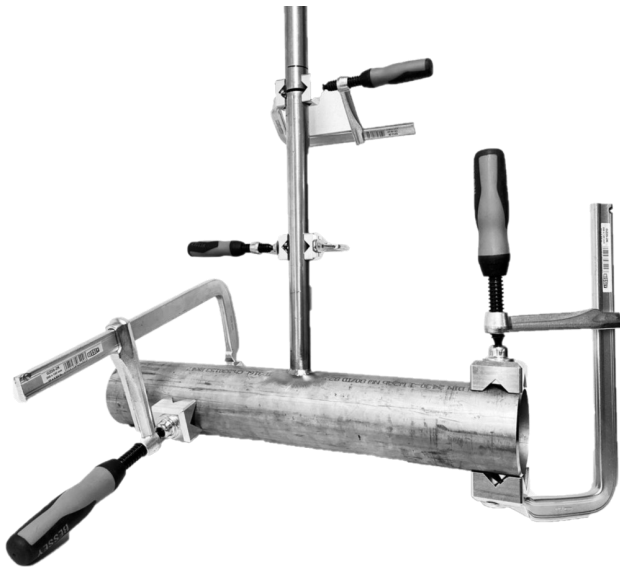


PIPE CLAMPS

V PAD PIPE CLAMPS



The convenient way to hold round or square tubes for butt-welding.



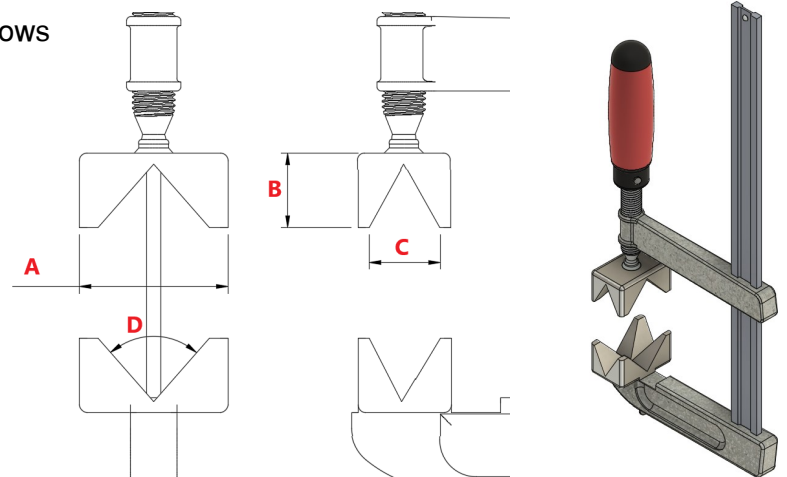
- ▶ Wide opening allows the Pipe Clamps to hold up to 270mm diameter pipes
- ▶ 2 large V-Pads provide a better clamping surface
- ▶ Clamp pads designed to suit your application

The **V Pad Pipe Clamps** can be used in the welding of all kind of materials such as carbon steel, stainless, duplex, super duplex and titanium.

Due to its design, the clamps ensure that the clamping forces are evenly spread around the pipe to be welded. This is true for all pipe dimensions within the range of the Clamps.

The arms are fabricated from steel which allows a clamping force to meet the requirements for all pipe dimensions within the range of the Clamps. The pads are manufactured from high grade aluminium to ensure rigidity but minimise risk of pipe damage.

The welding of pipe to pipe and pipe to fittings is easily performed with this Clamp. Five sizes of clamp are available covering all pipe diameters between 4-270mm.



Pipe Diameter	Part No.	Weight	Angle Adjustment
4-12mm	PSCX-1	0.34kg	45° /90°
12-54mm	PSCX-2	0.35kg	45° /90°
29-115mm	PSCX-3	1.60kg	45° /90°
129-220mm	PSCX-4	1.80kg	45° /90°
129-270mm	PSCX-5	1.90kg	45° /90°



PIPE STANDS

PJ1 PIPE JACKS



The PJ1 Pipe Stands are a basic single tubed pipe stand, simple to use and easy to set-up.

A favourite for low level work in all fab shops. Available in 4 standard heights from 7" (18cm) to 28" (72cm).

Optional roller heads from the PJ3 series can also be fitted to the Vee Head of the PJ1 Stand to suit varying applications.



Part No.	Min/Max Height (Imperial)	Min/Max Height (Metric)	Weight Load
PJ1-1	7" - 10.25"	175-260mm	450kgs
PJ1-2	10" - 15.5"	250-395mm	450kgs
PJ1-3	15.5" - 22.5"	395-570mm	450kgs
PJ1-4	21.5" - 28"	545-715mm	450kgs



PIPE STANDS

PJ3 PIPE JACKS



The **PJ3 Pipe Stands** three leg height adjustable pipe stands are constructed from box section and are available with a variety of different head styles to suit any application.

Standard V-Head options



Base Units

Part No.	Stand Type	Weight KG/LBS	Pipe Size
PJ3FXB	Fixed Leg	7.0 / 15.4	Up to 12"
PJ3FLB	Folding Leg	7.0 / 15.4	Up to 12"
PJ3FXB-PP	Flat Pak Fixed Leg	7.0 / 15.4	Up to 12"

Steel Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
SWK3	1,000 / 2,205	3.4 / 7	1" to 12"
SWK3SS	1,000 / 2,205	3.4 / 7	1" to 12"

Nylon Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
NWK350	450 / 990	4.9 / 11	1" to 12"

Pipe Roller Head - Nylon Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
NWK350	450 / 990	4.9 / 11	1" to 12"

Ball Transfers



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
BTK3	600 / 1320	2.5 / 6	1" to 12"
BTK3SS	600 / 1320	2.5 / 6	1" to 12"

Pipe Roller Head - Steel Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
SWK350	1,000 / 2,205	4.9 / 11	1" to 12"
SWK350SS	1,000 / 2,205	3.4 / 7	1" to 12"

Roller Ball Head



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
RBH	1,000 / 2,205	4.25 / 9	1/8" to 10"

Stainless Steel



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
NWK350	450 / 990	4.9 / 11	1" to 12"

Vee Head



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
PJ3V	1,000 / 2,205	3.4 / 7	Up to 12"

Pipe Hold Down Kit



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
HDK12	N/A	7/16	1" to 12"



Large V-Head options

Features

- ▶ Square box section construction
- ▶ 1,000kg / 2,205lbs load capacity
- ▶ Choice of Fixed base or Folding leg base
- ▶ Folding legs allow for easy storage
- ▶ Comprehensive range of head types
- ▶ Adjustable in height from 27"-48" (71cm-122cm)
- ▶ Independently load tested.



Steel Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
SWK4	1,000 / 2,205	3 / 6	1" to 24"
SWK4SS	1,000 / 2,205	3 / 6	1" to 24"

Nylon Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
LVH	1,000 / 2,205	7.6 / 17	UP TO 24"

Roller Ball Head



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
NWK4	450 / 990	1.8 / 4	1" - 24"

Pipe Roller Head - Steel Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
BTK4	600 / 1,320	2.3 / 5	1" to 24"
BTK4SS	600 / 1,320	2.3 / 5	1" to 24"

Pipe Roller Head - Nylon Wheels



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
SSC4	1,000 / 2,205	1 / 2.2	1" to 24"

Stainless Steel



Part No.	Load Capacity KG/LBS	Weight KG/LBS	Pipe Size
HDK	N/A	7 / 16	1" to 12"

PIPE STANDS

PJQ PIPE JACKS



Heavy duty pipe stands for large diameter and heavy wall pipe

Features

- ▶ Weight certified to 2500 Kg
- ▶ For pipe diameter up to 36" diameter
- ▶ Comprehensive range of head types
- ▶ Optional castor wheel for pipe transportation
- ▶ Suitable for carbon or stainless steel
- ▶ Height adjustable

The PJQ Heavy Duty Pipe Stands are the ideal solution for heavy duty pipe handling, in the workshop or for site applications.

The Large Vee Head, heavy duty base and variety of head options make the Quattro the most durable and versatile pipe stand on the market.

The Quattro stand can be used as a simple jack stand, supplied as standard with levelling pads to accommodate uneven working surfaces. Weight load tested to 2500kgs per stand, the Quattro stands can also be supplied with lockable castor wheels so pipes of up to 36" diameter can be moved around a workshop or site.



Transport pipe around the site or workshop with ease



Heavy duty pipe stands for large diameter and heavy wall pipe

Base Unit

(complete with levelling pads)



Part No.	Load Capacity KG	Weight KG	Pipe Size
PJQB	2,500	7.6 / 17	UP TO 24"

Large Vee Head



Part No.	Load Capacity KG	Weight KG	Pipe Size
LVH	2,500	7.5	1" - 36"

Wheel Kit Options



Part No.	Load Capacity KG	Weight KG	Material
SWK4	2,000	8	Steel
SWK4SS	2,000	8	Stainless
NWK4	450	1	Nylon

Ball Transfer Kits



Part No.	Load Capacity KG	Weight KG/	Pipe Size
BTK4	600	2	1" - 36"
BTK4SS	600	2	1" - 36"

Hold Down Device



Part No.	Load Capacity KG	Weight KG	Pipe Size
HDK36	N/A	7	1" - 12"

Stainless Steel Sleeve



Part No.	Load Capacity KG/LBS	Weight KG	Pipe Size
SSC4	2,500	0.5	1" - 36"

Roller Wheel Kit



Part No.	Load Capacity KG	Weight KG	Pipe Size
RWK4	2,000	20	N/A

Wire Gauge to Millimetres

GAUGE NO.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
BG-mm	3.99	3.55	3.17	2.83	2.52	2.24	1.99	1.77	1.59	1.41	1.26	1.12	1.00	0.79	0.79	0.71	0.63
SWG-mm	4.05	3.66	3.25	2.95	2.64	2.34	2.03	1.83	1.62	1.42	1.22	1.02	0.91	0.81	0.71	0.61	0.56
BWG-mm	4.19	3.76	3.40	3.05	2.77	2.41	2.11	1.83	1.65	1.47	1.24	1.07	0.89	0.81	0.71	0.63	0.56

Chart to Determine Inside Diameter of Tubes (Inches)

BWG	WALL THICKNESS	OUTSIDE DIAMETER TUBES																				
		¼	3/8	½	5/8	¾	7/8	1	1 ¼	1 ½	1 ¾	2	2 ¼	2 ½	2 ¾	3	3 ¼	3 ½	3 ¾	4	4 ¼	4 ½
00	.380	-	-	-	-	.115	.240	.490	.740	.990	1.24	1.49	1.74	1.99	2.24	2.49	2.74	2.99	3.24	3.49	3.74	
0	.340	-	-	-	.070	.195	.320	.57	.82	1.07	1.32	1.57	1.82	2.07	2.32	2.57	2.82	3.07	3.32	3.57	3.82	
1	.300	-	-	.025	.150	.275	.400	.550	.900	1.15	1.40	1.65	1.90	2.15	2.40	2.65	2.90	3.15	3.40	3.65	3.90	
2	.284	-	-	.057	.182	.307	.432	.682	.932	1.182	1.432	1.682	1.932	2.182	2.432	2.682	2.932	3.182	3.432	3.682	3.932	
3	.259	-	-	.107	.232	.357	.482	.732	.982	1.232	1.482	1.732	1.982	2.232	2.482	2.732	2.982	3.232	3.482	3.732	3.982	
4	.238	-	-	.024	.149	.274	.399	.524	.774	1.024	1.274	1.524	1.774	2.024	2.274	2.524	2.774	3.024	3.274	3.524	3.774	4.024
5	.220	-	-	.060	.185	.310	.435	.560	.810	1.060	1.310	1.560	1.810	2.050	2.310	2.560	2.810	3.060	3.310	3.560	3.810	4.060
6	.203	-	-	.094	.219	.344	.469	.594	.844	1.094	1.344	1.594	1.844	2.094	2.344	2.594	2.844	3.094	3.344	3.594	3.844	4.094
7	.180	-	-	.140	.265	.390	.515	.640	.890	1.140	1.390	1.640	1.890	2.140	2.390	2.640	2.890	3.140	3.390	3.640	3.890	4.140
8	.165	-	.045	.170	.295	.420	.545	.670	.920	1.170	1.420	1.670	1.920	2.170	2.420	2.670	2.920	3.170	3.420	3.670	3.920	4.170
9	.148	-	.079	.204	.329	.454	.579	.704	.954	1.204	1.454	1.704	1.954	2.204	2.454	2.704	2.954	3.204	3.454	3.704	3.954	4.204
10	.134	-	.107	.232	.357	.482	.607	.732	.982	1.232	1.482	1.732	1.982	2.232	2.482	2.732	2.982	3.232	3.482	3.732	3.982	4.232
11	.120	-	.135	.260	.385	.510	.635	.760	1.010	1.260	1.510	1.760	2.010	2.260	2.510	2.760	3.010	3.260	3.510	3.760	4.010	4.260
12	.109	.032	.157	.282	.407	.532	.657	.782	1.032	1.282	1.532	1.782	2.032	2.282	2.532	2.782	3.032	3.282	3.532	3.782	4.032	4.282
13	.095	.060	.185	.310	.435	.560	.685	.810	1.060	1.310	1.560	1.810	2.060	2.310	2.560	2.810	3.060	3.310	3.560	3.810	4.060	4.310
14	.083	.084	.209	.334	.459	.584	.709	.834	1.084	1.334	1.584	1.834	2.084	2.334	2.584	2.834	3.084	3.334	3.584	3.834	4.084	4.334
15	.072	.106	.231	.356	.481	.606	.731	.856	1.106	1.356	1.606	1.856	2.106	2.356	2.606	2.856	3.106	3.356	3.606	3.856	4.106	4.356
16	.065	.120	.245	.370	.495	.620	.745	.870	1.120	1.370	1.620	1.870	2.120	2.370	2.620	2.870	3.120	3.370	3.620	3.870	4.120	4.370
17	.058	.134	.259	.384	.509	.634	.759	.884	1.134	1.384	1.634	1.884	2.134	2.384	2.634	2.884	3.134	3.384	3.634	3.884	4.134	4.384
18	.049	.152	.277	.402	.527	.652	.777	.902	1.152	1.402	1.652	1.902	2.152	2.402	2.652	2.902	3.152	3.402	3.652	3.902	4.152	4.402
19	.042	.166	.291	.416	.541	.666	.791	.916	1.166	1.416	1.666	1.916	-	-	-	-	-	-	-	-	-	-
20	.035	.180	.305	.430	.555	.680	.805	.930	1.180	1.430	1.680	1.930	-	-	-	-	-	-	-	-	-	-
21	.032	.186	.311	.436	.561	.686	.811	.936	1.186	1.436	1.686	1.936	-	-	-	-	-	-	-	-	-	-
22	.028	.194	.319	.444	.569	.694	.819	.944	1.194	1.444	1.694	1.944	-	-	-	-	-	-	-	-	-	-
23	.025	.200	.325	.450	.575	.700	.825	.950	1.200	1.450	1.700	1.950	-	-	-	-	-	-	-	-	-	-
24	.022	.206	.331	.456	.581	.706	.831	.956	1.206	1.456	1.706	1.956	-	-	-	-	-	-	-	-	-	-

Chart to Determine Pipe Size and Schedule Number

NOMINAL PIPE SIZE	O.D. (IN)	SCHEDULE NUMBER FOR PIPE SIZES WALL THICKNESS / INSIDE DIAMETER (INCHES)							
		40	I.D.	80	I.D.	120	I.D.	160	I.D.
1/8	.405	.068	.269	.095	.215	-	-	-	-
¼	.540	.088	.364	.119	.302	-	-	-	-
3/8	.675	.091	.493	.126	.423	-	-	-	-
½	.840	.109	.622	.147	.546	-	-	.187	.466
¾	1.050	.113	.824	.154	.742	-	-	.218	.614
1	1.315	.133	1.049	.179	.957	-	-	.230	.815
1 ¼	1.660	.140	1.380	.191	1.28	-	-	.250	1.160
1 ½	1.900	.145	1.610	.200	1.500	-	-	.281	1.338
2	2.375	.154	2.067	.218	1.939	-	-	.343	1.689
2 ½	2.875	.203	2.469	.276	2.323	-	-	.375	2.125
3	3.500	.216	3.068	.300	2.900	-	-	.437	2.626
3 ½	4.000	.226	3.548	.318	3.364	-	-	-	-
4	4.500	.237	4.026	.337	3.826	.437	3.626	.531	3.438
5	5.563	.258	5.047	.375	4.813	.500	4.563	.625	4.313
6	6.625	.280	6.065	.432	5.761	.562	5.501	.718	5.189
8	8.625	.322	7.981	.500	7.625	.718	7.189	.906	6.813
10	10.750	.365	10.020	.593	9.564	.843	9.064	1.125	8.500
12	12.750	.406	11.938	.687	11.376	1.000	10.750	1.312	10.126

Common Imperial Sizes to Metric

mm	6.35	9.53	12.70	15.89	19.05	22.23	25.40	31.75	38.10	44.45	50.80	57.15	63.5	69.85
Inch	¼"	3/8"	½"	5/8"	¾"	7/8"	1"	1 ¼"	1 ½"	1 ¾"	2"	2 ¼"	2 ½"	2 ¾"
	0.25	0.375	0.500	0.625	0.75	0.875	1	1.25	1.5	1.75	2	2.25	2.5	2.75

Conversion from Millimeters to Inches

mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
0.1	0.00394	1	0.03937	51	2.0079	101	3.9764	151	5.9449
0.2	0.00787	2	0.07874	52	2.0472	102	4.0157	152	5.9842
0.3	0.01181	3	0.11811	53	2.0866	103	4.0551	153	6.0236
0.4	0.01575	4	0.15748	54	2.1260	104	4.0945	154	6.0630
0.5	0.01969	5	0.19685	55	2.1654	105	4.1339	155	6.1024
0.6	0.02362	6	0.23622	56	2.2047	106	4.1732	156	6.1417
0.7	0.02756	7	0.27559	57	2.2441	107	4.2126	157	6.1811
0.8	0.03150	8	0.31496	58	2.2835	108	4.2520	158	6.2205
0.9	0.03543	9	0.35433	59	2.3228	109	4.2913	159	6.2598
1.0	0.03937	10	0.39370	60	2.3622	110	4.3307	160	6.2992
1.1	0.04331	11	0.43307	61	2.4016	111	4.3701	161	6.3386
1.2	0.04724	12	0.47244	62	2.4409	112	4.4094	162	6.3779
1.3	0.05118	13	0.51181	63	2.4803	113	4.4488	163	6.4173
1.4	0.05512	14	0.55118	64	2.5197	114	4.4882	164	6.4567
1.5	0.05906	15	0.59055	65	2.5591	115	4.5276	165	6.4961
1.6	0.06299	16	0.62992	66	2.5984	116	4.5669	166	6.5464
1.7	0.06693	17	0.66929	67	2.6378	117	4.6063	167	6.5748
1.8	0.07087	18	0.70866	68	2.6772	118	4.6457	168	6.6142
1.9	0.07480	19	0.74803	69	2.7165	119	4.6850	169	6.6535
2.0	0.07874	20	0.78740	70	2.7559	120	4.7244	170	6.6929
2.1	0.08268	21	0.82677	71	2.7953	121	4.7638	171	6.7323
2.2	0.08661	22	0.86614	72	2.8346	122	4.8031	172	6.7716
2.3	0.09055	23	0.90551	73	2.8740	123	4.8425	173	6.8110
2.4	0.09449	24	0.94488	74	2.9134	124	4.8819	174	6.8898
2.5	0.09843	25	0.98425	75	2.9528	125	4.9212	175	6.9291
2.6	0.10236	26	1.0236	76	2.9921	126	4.9606	176	6.9685
2.7	0.10630	27	1.0630	77	3.0315	127	5.0000	177	7.0079
2.8	0.11024	28	1.1024	78	3.0709	128	5.0394	178	7.0472
2.9	0.11417	29	1.1417	79	3.1102	129	5.0787	179	7.0472
3.0	0.11811	30	1.1811	80	3.1496	130	5.1181	180	7.0866
3.1	0.12205	31	1.2205	81	3.1890	131	5.1575	181	7.1260
3.2	0.12598	32	1.2598	82	3.2283	132	5.1968	182	7.1653
3.3	0.12992	33	1.2992	83	3.2677	133	5.2362	183	7.2047
3.4	0.13386	34	1.3386	84	3.3071	134	5.2756	184	7.2441
3.5	0.13780	35	1.3780	85	3.3465	135	5.3149	185	7.2835
3.6	0.14173	36	1.4173	86	3.3858	136	5.3543	186	7.3228
3.7	0.14567	37	1.4567	87	3.4252	137	5.3937	187	7.3622
3.8	0.14961	38	1.4961	88	3.4646	138	5.4331	188	7.4016
3.9	0.15354	39	1.5354	89	3.5039	139	5.4724	189	7.4409
4.0	0.15748	40	1.5748	90	3.5433	140	5.5118	190	7.4803
4.1	0.16142	41	1.6142	91	3.5827	141	5.5512	191	7.5197
4.2	0.16535	42	1.6535	92	3.6220	142	5.5905	192	7.5590
4.3	0.16929	43	1.6929	93	3.6614	143	5.6299	193	7.5984
4.4	0.17323	44	1.7323	94	3.7008	144	5.6693	194	7.6378
4.5	0.17717	45	1.7717	95	3.7402	145	5.7087	195	7.6772
4.6	0.18110	46	1.8110	96	3.7795	146	5.7480	196	7.7165
4.7	0.18504	47	1.8504	97	3.8189	147	5.7874	197	7.7559
4.8	0.18898	48	1.8898	98	3.8583	148	5.8268	198	7.7953
4.9	0.19291	49	1.9291	99	3.8976	149	5.8661	199	7.8346
5.0	0.19685	50	1.9685	100	3.9370	150	5.9055	200	7.8740

Common Conversion Factors

WEIGHTS				
	FACTOR		FACTOR	
Grams	0.0010	Kilograms	1,000.00	Grams
Grams	0.0353	Ounces	28.3495	Grams
Grams	0.0022	Pounds	453.5924	Grams
Kilograms	35.2740	Ounces	0.0283	Kilograms
Kilograms	2.2046	Pounds	0.4536	Kilograms
Ounces	0.0625	Pounds	16.0000	Ounces
FLOW RATES				
	FACTOR		FACTOR	
Cubic Feet per Minute	0.0283	Cubic Metres per Minute	35.3133	Cubic Feet per Minute
Cubic Feet per Minute	7.4805	Gallons per Minute	0.1337	Cubic Feet per Minute
Cubic Feet per Minute	28.3163	Litres per Minute	0.0353	Cubic Feet per Minute
Cubic Metres per Minute	264.1700	Gallons per Minute	0.0038	Cubic Metres per Minute
Cubic Metres per Minute	1,000.00	Litres per Minute	0.0010	Cubic Metres per Minute
Gallons per Minute	3.7878	Litres per Minute	0.2641	Gallons per Minute
MEASURES				
	FACTOR		FACTOR	
Millimetres	0.1000	Centimetres	10.0000	Millimetres
Millimetres	0.0010	Metres	1,000.00	Millimetres
Millimetres	0.0033	Feet	304.801	Millimetres
Millimetres	0.0394	Inches	25.4000	Millimetres
Metres	100.0000	Centimetres	0.0100	Metres
Metres	3.2808	Feet	0.3048	Metres
Metres	39.3700	Inches	0.0254	Metres
PRESSURE				
	FACTOR		FACTOR	
Bar	1.0197	Kilograms/sq Centimetres	0.9807	Bar
Bar	14.5038	Pounds/sq Inch	0.0689	Bar
Pounds/sq Inch	0.0703	Kilograms/sq Centimetres	14.22	Pounds/sq Inch

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