

WHAT WE OFFER

SUBZERO presents following tube pulling systems for pulling out tubes from Heat Exchanger in oil refinery, & from Condenser in power plant & from Boiler in sugar mills.

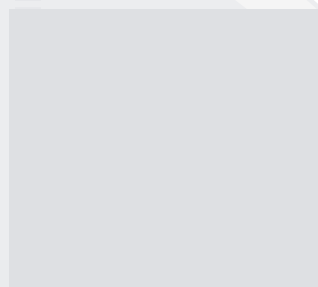
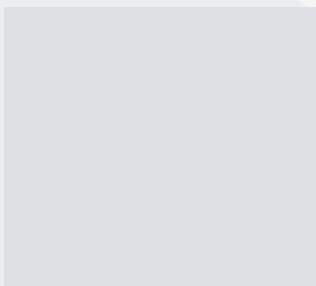
CONTINUES TUBE PULLING SYSTEM

- TUBE RUNNER – 5 (AUTO) is a continues tube pulling machine for removal of tubes from Heat Exchanger, condensers & straight tube boilers.
- Available in hydro-electric & hydro-pneumatic versions.
- Suitable for big maintenance or shutdown jobs



STUB PULLING SYSTEM

- TUBE RUNNER-3 / TUBE RUNNER-2 are only stub pulling machines for removal of cut stubs from tube sheet of U-tube & Bi-drum boilers.
- Available in hydro-electric & hydro-pneumatic versions.
- Suitable for big maintenance or shutdown jobs
- Compact Size.
- SAHP is compact portable stub pulling machine suitable for removal of stubs from heat exchanger / condenser
- Available in pneumatic version only.
- Suitable for thin tube sheet thickness from 20 to 50mm
- Suitable for small maintenance jobs.
- X-TRACTOR is compact automated stub pulling machine suitable for fast removal of stubs from heat exchanger / condenser.
- Available in electric version only.
- Suitable for thin tube sheet thickness from 20 to 50 mm
- Very fast compared to other stub pulling methods.



CONTINUES TUBE PULLING SYSTEMS

SUBZERO offers continues tube pulling machine for removal of tubes from Heat Exchanger, condensers & straight tube boilers.

- Interchangeable pulling gun with same power pack.
- Pulling gun communicates with power pack via 24VDC control cable or pneumatic control cable.
- Removes tubes without damaging the tube sheet.
- Low setup time and ease of operation
- Auto switch over from low pressure high flow to high pressure - low flow on load and again back to low pressure – high flow when load is released.
- Automatic slow pulling of tube during tube sheet to tube bond breakage to minimize breakage of tubes & increase consumable life.
- Compact & ergonomic design of gun & power pack.
- Capacity to pull up to 4" tube continuously & 5" stub.
- Low maintenance cost and world wide availability of components
- Significant saving of time over conventional method of tube removal.
- Unit is portable with handle and mounted on four wheels for easy handling.
- Unit will pull tube continuously thru the gun effortlessly, needing only one man for operation.

TUBE PULLING POWER PACK SPECIFICATION

SPECIFICATION	TUBE RUNNER- 5 AUTO (Hydro-Electric)	TUBE RUNNER- 9 AUTO (Hydro-Pneumatic)
Input	3 Phase 415 +/- 10%V	Air Supply of 275 CFM @ 90 PSL
Power	3.7 K.W., 5h.P.	7.1 K.W., 9 HP
Max Working Pressure (Bar)	350	350
Weight Without Oil	220 kg.	220 kg.
Control	24 Volt DC	Pneumatic Control
Hydraulic Hose	¾" I.D.(Forward), ½"I.D.(Reverse) 5m long	¾" I.D.(Forward), ½"I.D.(Reverse) 5m long
Dimension (mm).(L X W X H)	1020 X 680 X 960	1020 X 680 X 960



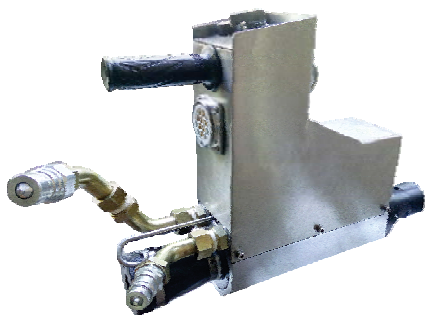
TUBE RUNNER - 5 AUTO (Hydro - Electric)



TUBE RUNNER - 9 AUTO (Hydro - Pneumatic)

TUBE PULLING GUN SPECIFICATION

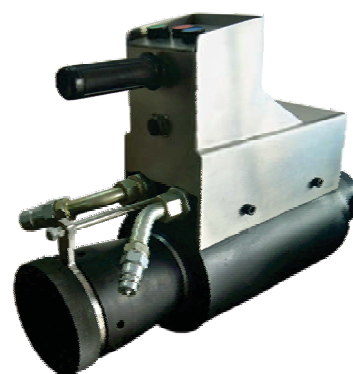
SPECIFICATION	AUTO PULLER-15	AUTO PULLER-30	AUTO PULLER-45	AUTO PULLER-60
Max. Capacity (tons)	15	30	45	60
Stroke Length (mm)	150	150	150	100
Pulling Speed With TUBE RUNNER- 5 / 9 Auto	5.0	3.0	2.0	1.2
Max. Dia. Through Gun (mm / inches)	25.4 / 1 "	38.1 / 1 ½ "	76.2 / 3 "	101 / 6 4"
Weight (kg)	26	38	78 .	102
Max. Working Pressure (bar)	350	350	350	350
Dimension (mm) (L x W x H)	453 x 255 x 270	520 x 250 x 510	495 x 332 x 346.5	420 x 450 x 510



AUTO PULLER - 15



AUTO PULLER - 30



AUTO PULLER - 45

RECOMMENDED TUBE PULLING ACCESSORIES

SUBZERO recommends following accessories to aid faster removal of tubes and stubs.

- IMPACT WRENCH - For tightening & loosening of tube pulling mandrel inside the tube ID.
- SPRING BALANCER - For load free hanging of tube pulling gun during tube pulling operation.

TUBE PULLING CONSUMABLES

ITEMS	SPECIFICATION FOR ORDERING
Tube pulling mandrel	OD & ID of tube (refer page no. 74 to 76)
Pulling Collar	OD of tube & pulling gun model (refer page no. 76)
Front Pulling jaw	OD of tube & pulling gun model (refer page no. 77)
Rear Pulling jaw	OD of tube & pulling gun model (refer page no. 77)
Pulling Accessories	(refer page no. 77)



TUBE PULLING MANDREL



TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
3/8"	9.53	6.5-7.5	0.260-0.295	5/16"	PM-7	AUTO PULLER - 15/30
		7.5-8.5	0.295-0.335	5/16"	PM-8	
1/2"	12.70	8.5-9.5	0.335-0.375	3/8"	PM-9	
		9.5-10.5	0.375-0.415	3/8"	PM-10	
		10.5-11.5	0.415-0.455	3/8"	PM-11	
		11.5-12.5	0.455-0.595	3/8"	PM-12	
		12.5-13.5	0.495-0.535	1/2"	PM-13A	
5/8"	15.88	13.5-14.5	0.535-0.570	1/2"	PM-14A	
		14.5-15.5	0.570-0.610	1/2"	PM-15A	

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
3/4"	19.05	12.5-13.5	0.495-0.535	5/8"	PM-13	AUTO PULLER - 15/30
		13.5-14.5	0.535-0.570	5/8"	PM-14	
		14.5-15.5	0.570-0.610	5/8"	PM-15	
		15.5-16.5	0.610-0.650	5/8"	PM-16	
		16.5-17.5	0.650-0.690	5/8"	PM-17	
		17.5-18.5	0.690-0.730	5/8"	PM-18	
		17.5-18.5	0.690-0.730	5/8"	PM-18S	
7/8"	22.22	18.5-19.5	0.730-0.768	5/8"	PM-19S	
		19.5-20.5	0.768-0.807	5/8"	PM-20S	

TUBE PULLING MANDREL

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
1"	25.4	18.5-19.5	0.730-0.770	3/4"	PM-19	AUTO PULLER - 15/30
		19.5-20.5	0.770-0.810	3/4"	PM-20	
		20.5-21.5	0.810-0.845	3/4"	PM-21	
		21.5-22.5	0.845-0.885	3/4"	PM-22	
		22.5-23.5	0.885-0.925	3/4"	PM-23	
		23.5-24.5	0.925-0.965	3/4"	PM-24	

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
1.1/4"	31.75 5	24.5-25.5	0.965-1.005	1"	PM-25	AUTO PULLER - 30
		25.5-26.5	1.005-1.045	1"	PM-26	
		26.5-27.5	1.045-1.085	1"	PM-27	
		27.5-28.5	1.085-1.125	1"	PM-28	
		28.5-29.5	1.125-1.160	1"	PM-29	
		29.5-30.5	1.160-1.200	1"	PM-30	
		30.5-31.5	1.200-1.240	1"	PM-31	

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
1.1/2"	38.10	31.5-32.5	1.240-1.280	1"	PM-32	AUTO PULLER - 30
		32.5-33.5	1.280-1.320	1"	PM-33	
		33.5-34.5	1.320-1.360	1"	PM-34	
		34.5-35.5	1.360-1.400	1"	PM-35	
		35.5-36.5	1.400-1.440	1"	PM-36	
		36.5-37.5	1.440-1.475	1"	PM-37	

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
1.3/4"	44.4"	37.5-38.5	1.476-1.516	1"	PM-38/44	AUTO PULLER - 45
		38.5-39.5	1.516-1.555	1"	PM-39/44	
		39.5-40.5	1.555-1.594	1"	PM-40/44	
		40.5-41.5	1.594-1.634	1"	PM-41/44	
		41.5-42.5	1.634-1.673	1"	PM-42/44	
		42.5-43.5	1.673-1.713	1"	PM-43/44	

TUBE PULLING MANDREL

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
2"	50.8	43.5-44.5	1.713-1.752	1"	PM-44/51	AUTO PULLER - 45
		44.5-45.5	1.752-1.791	1"	PM-45/51	
		45.5-46.5	1.791-1.831	1"	PM-46/51	
		46.5-47.5	1.831-1.870	1"	PM-47/51	
		47.5-48.5	1.870-7.909	1"	PM-48/51	
		48.5-49.5	1.909-1.949	1"	PM-49/51	

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
2.1/4"	57.1	49.5-50.5	1.949-1.988	1.1/2"	PM-50/57	AUTO PULLER - 45
		50.5-51.5	1.988-2.028	1.1/2"	PM-51/57	
		51.5-52.5	2.028-2.067	1.1/2"	PM-52/57	

TUBE OD		SUITABLE FOR TUBE ID RANGE		SQUARE A/F	MODEL	SUITABLE PULLING GUN
MM	INCHES	MM	INCHES			
2.1/2"	63.5	53.5-54.5	2.106-2.146	1.1/2"	PM-54/63	AUTO PULLER - 45
		54.5-55.5	2.146-2.185	1.1/2"	PM-55/63	
		55.5-56.5	2.185-2.224	1.1/2"	PM-56/63	
		56.5-57.5	2.224-2.264	1.1/2"	PM-57/63	

TUBE PULLING COLLAR

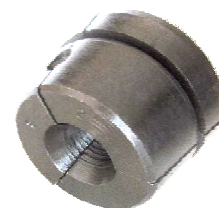
Suitable for Tube OD		AUTO PULLER / STUB PULLER 15	AUTO PULLER / STUB PULLER 30	AUTO PULLER / STUB PULLER 45	AUTO PULLER / STUB PULLER 60
MM	INCHES				
9.53	3/8"	PC-11	PC-11		
12.70	1/2"	PC-14	PC-14		
15.88	5/8"	PC-18	PC-18		
19.05	3/4"	PC-21	PC-21		
22.22	7/8"	PC-25	PC-25		
25.40	1"	PC-28	PC-28	PC-45/28	
31.75	1.1/4"		PC-34	PC-45/34	
98.10	1.1/2"		PC-41	PC-45/41	
44.40	1.3/4"			PC-45/48	
50.80	2"			PC-45/56	PC-60/56
57.10	2.1/4"			PC-45/60	PC-60/60
63.5	2.1/2"			PC-45/66	PC-60/66
76.2	3"				PC-60/80
88.9	3.1/2"				PC-60/93
101.6	4"				PC-60/105





TUBE PULLING JAWS

TUBE OD		AUTO PULLER - 15		AUTO PULLER - 30		AUTO PULLER - 45		AUTO PULLER - 60	
MM	INCHES	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR
9.53	3/8"	PJ-15-1F	PJ-15-1R	PJ-30-1F	PJ-30-1R				
12.70	1/2"	PJ-15-2F	PJ-15-2R	PJ-30-2F	PJ-30-2R				
15.88	5/8"	PJ-15-3F	PJ-15-3R	PJ-30-3F	PJ-30-3R				
19.05	3/4"	PJ-15-4F	PJ-15-4R	PJ-30-4F	PJ-30-4R				
22.22	7/8"	PJ-15-5F	PJ-15-5R	PJ-30-4AF	PJ-30-4AR				
25.40	1"			PJ-30-5F	PJ-30-5R	PJ-45-5F	PJ-45-5R		
31.75	1.1/4"			PJ-30-7F	PJ-30-7R	PJ-45-7F	PJ-45-7R		
38.10	1.1/2"			PJ-30-9F	PJ-30-9R	PJ-45-9F	PJ-45-9R		
44.40	1.3/4"					PJ-45-11F	PJ-45-11R		
50.80	2"					PJ-45-13F	PJ-45-13R	PJ-60-13F	PJ-60-13R
57.10	2.1/4"					PJ-45-14F	PJ-45-14R	PJ-60-14F	PJ-60-14R
63.5	2.1/2"					PJ-45-16F	PJ-45-16R	PJ-60-16F	PJ-60-16R
76.2	3"					PJ-45-17F	PJ-45-17R	PJ-60-17F	PJ-60-17R
88.9	3.1/2"							PJ-60-18F	PJ-60-18R
101.6	4"							PJ-60-19F	PJ-60-19R



FRONT JAW



REAR JAW

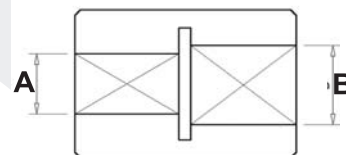
TUBE PULLING ACCESSORIES

AIR IMPACT WRENCH

MODEL	SUITABLE FOR TUBE PULLING MANDREL MODEL	SQUARE DRIVE
IMP - 1	PM - 7 to PM - 24	3/4"
IMP - 2	PM - 25 to PM - 37	1"
IMP - 2A	PM - 38 to PM - 49/51	1"
IMP - 3	PM - 50/57 to PM - 95/102	1.1/2"



PULLING SOCKET



MODEL	A	B
PS - 1	3/4	3/8
PS - 2	3/4	1/2
PS - 3	3/4	5/8
PS - 4	3/4	3/4
PS - 5	1	3/4
PS - 6	1	1
PS - 7	1.1/2	1
PS - 8	1.1/2	1.1/2

SPRING BALANCER

ABOUT	LOAD LIFTING RANGE	SUITABLE FOR PULLING GUN
SZSB - 30	20 TO 30	AUTO PULLER - 15
SZSB - 40	30 TO 40	AUTO PULLER - 30
SZSB - 85	70 TO 85	AUTO PULLER - 45
SZSB - 120	100 TO 120	AUTO PULLER - 60



SPRING BALANCER



PULLING SOCKET