

STRUCTURE OF TUBE EXPANDERS

Tube expanders are tools used to expand tubes by rolling, forming a tight and secure joint between the tube and the tube sheet.

They are widely used in boilers, heat exchangers, evaporators, air coolers, and other industrial equipment, including cooling systems for nuclear power plants.

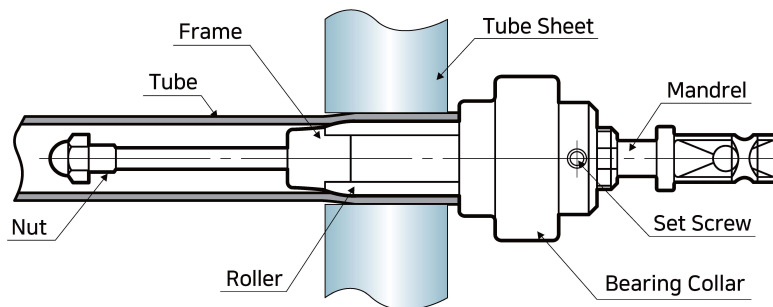
▼ NAME OF COMPONENTS

The picture below includes names of the main parts of an expander.

CK TYPE TUBE EXPANDER

The CK Type tube expanders are designed where the tube sheet thickness ranges from 22mm to 60mm.

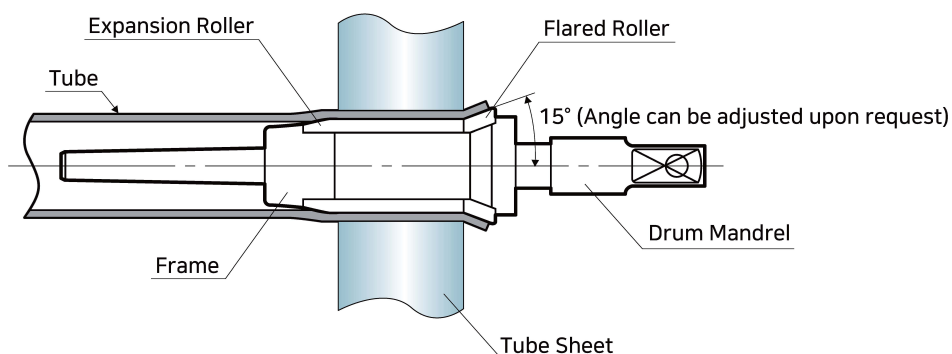
It provides stable and precise rolling performance suitable for general tube expansion work.



BK TYPE TUBE EXPANDER

The BK Type tube expander is specifically designed for boiler tubes, where a flared tube end is required to prevent leakage.

This model allows both expansion and flaring in a single operation, making it ideal for heavy-duty boiler applications.



STANDARD TYPE TUBE EXPANDERS

MK TYPE (3-ROLLER) EXPANDER

Applications

- Tube I.D. : 4.5mm(3/16") ~ 9.5mm(3/8")
- Roller length : 18mm(11/16"), 25.4mm(1")



CK TYPE (3-ROLLER) EXPANDER

Applications

- Tube I.D. : 9.5mm(3/8") ~ 92mm(3-5/8")
- Roller length : 38mm(1-1/2"), 57mm(2-1/4") and 76mm(3")



HK TYPE (3-ROLLER) EXPANDER

Applications

- Tube I.D. : 9.5mm(3/8") ~ 92mm(3-5/8")
- Roller length : 38mm(1-1/2"), 57mm(2-1/4") and 76mm(3")

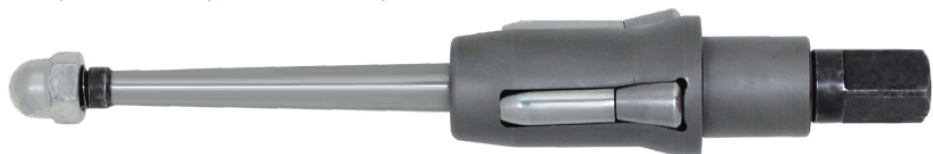


BK TYPE (6-ROLLER) EXPANDER

Applications

- Tube I.D. : 21mm(13/16") ~ 106mm(4-3/16")
- Roller length : 19mm(3/4") ~ 83mm(3-1/4")

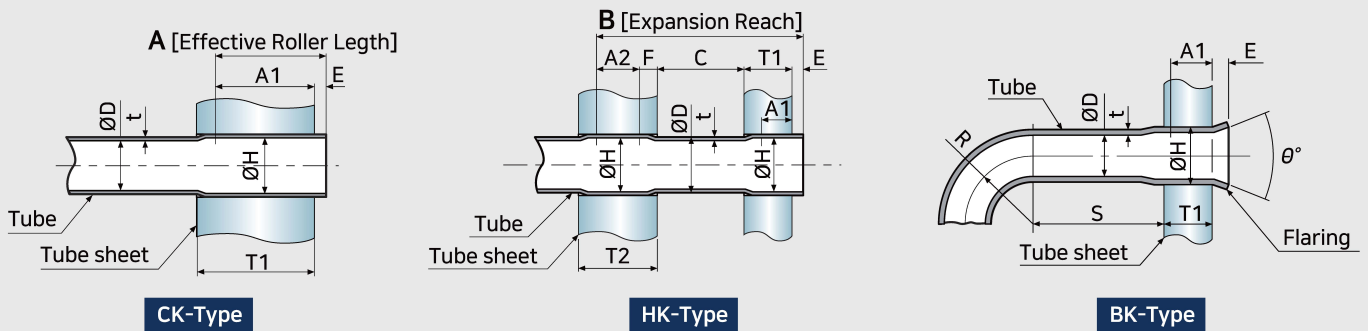
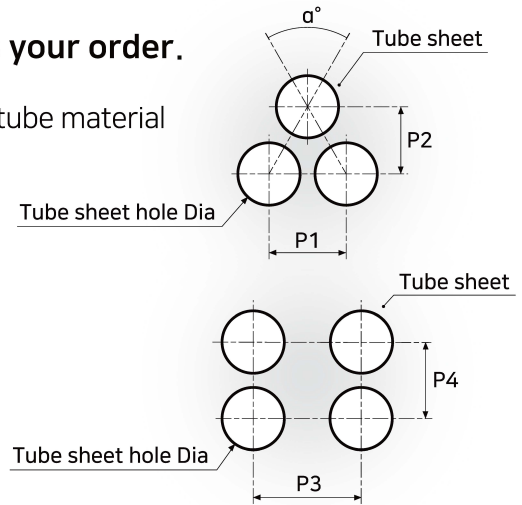
* Usage : Boilers, superheaters, waterwalls, economizers, etc.



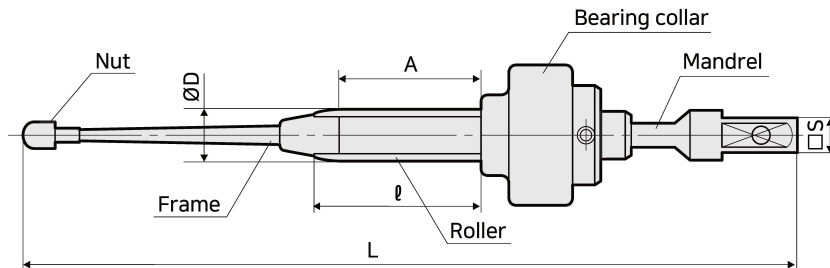
STANDARD TYPE EXPANDER TOOLS

The information listed below is required to process your order.

1. Tube O.D.($\varnothing D$), tube thickness(t), tube thickness tolerance, tube material
2. Tube sheet material, tube sheet thickness(T1, T2)
3. Hole diameter of tube sheet($\varnothing H$)
4. Tube sheet hole pitch(P1, P2, P3, P4)
5. Effective roller length(A1, A2)
6. Tube projection(E)
7. Expansion reach(A), (B)
8. If flare expansion is required, flare angle(θ°)
9. Length of straight tube part(S)
10. Curve radius of bent tube part(R)
11. Tube Expander type(CK, HK, BK)



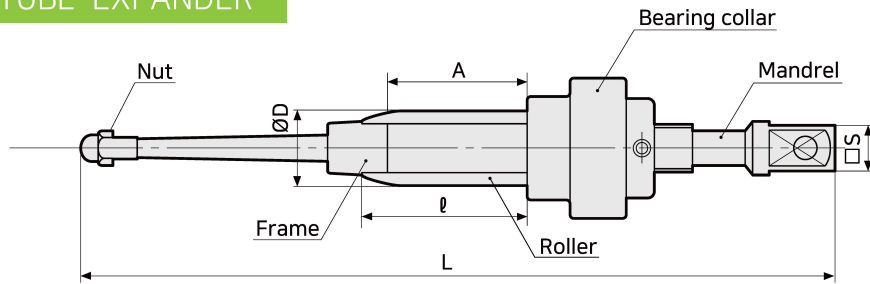
MK TYPE TUBE EXPANDER



Tool No.		Expansion Range $\varnothing D$		Effective Roller Reach A				Mandrel		
Roller Reach l		Min. mm	Max. mm	18mm		25.4mm		No.	Square S mm (in.)	Length L mm (in.)
18mm	25.4 mm			Min. mm	Max. mm	Min. mm	Max. mm			
-	MK-11	5.4	6.4	-	-	13	20	MK-1	6.3 (1/4)	130 (5.12)
	MK-12	5.8	6.8	-	-	-	-			
	MK-13	6.2	7.2	-	-	-	-			
-	MK-14	6.6	7.7	-	-	13	20	MK-2	6.3 (1/4)	130 (5.12)
	MK-15	7.0	8.1	-	-	-	-			
	MK-16	7.4	8.6	-	-	-	-			
-	MK-17	7.8	9.0	-	-	13	20	MK-3	6.3 (1/4)	130 (5.12)
	MK-18	8.2	9.4	-	-	-	-			
	MK-19	8.6	9.8	-	-	-	-			
	MK-20	9.0	10.2	-	-	-	-			

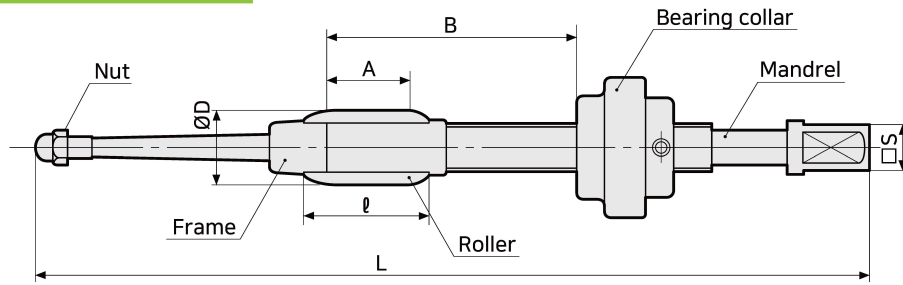
Note : If a Long Type is required, please submit a separate request.

CK TYPE TUBE EXPANDER



Tool No.			Expansion Range ØD				Mandrel		
Roller Reach l			Min. mm	Max. Expansion			No.	Square S mm (in.)	Length L mm (in.)
38mm	57mm	76mm		38mm	57mm	76mm			
CK-101	-	-	9.2	10.9	-	-	CK-1	9.5 (3/8)	225 (8.86)
CK-103 CK-105	-	-	10.0 10.8	11.7 12.5	-	-	CK-2		
CK-107 CK-109 CK-111	CK-207 CK-209 CK-211	-	11.6 12.4 13.2	13.5 14.3 15.1	13.2 14.0 14.8	-	CK-4	9.5 (3/8)	225 (8.86)
CK-113 CK-115 CK-117	CK-213 CK-215 CK-217	CK-313 CK-315 CK-317	14.0 14.8 15.6	16.2 17.0 17.8	15.8 16.6 17.4	15.4 16.2 17.0	CK-6	9.5 (3/8)	225 (8.86)
CK-119 CK-121 CK-123	CK-219 CK-221 CK-223	CK-319 CK-321 CK-323	16.4 17.1 17.9	18.9 19.7 20.5	18.4 19.2 20.0	18.0 18.8 19.6	CK-8	9.5 (3/8)	228 (8.98)
CK-125 CK-127 CK-129 CK-131	CK-225 CK-227 CK-229 CK-231	CK-325 CK-327 CK-329 CK-331	18.7 19.5 20.3 21.1	21.5 22.3 23.1 23.9	21.1 21.9 22.6 23.4	20.6 21.4 22.1 22.9	CK-10	9.5 (3/8)	228 (8.98)
CK-132 CK-134 CK-136 CK-138 CK-140	CK-232 CK-234 CK-236 CK-238 CK-240	CK-332 CK-334 CK-336 CK-338 CK-340	21.5 22.3 23.1 23.9 24.7	25.0 25.8 26.5 27.3 28.1	24.4 25.2 26.0 26.8 27.6	23.8 24.6 25.4 26.2 27.0	CK-11	12.7 (1/2)	238 (9.37)
CK-142 CK-144 CK-146 CK-148 CK-150	CK-242 CK-244 CK-246 CK-248 CK-250	CK-342 CK-344 CK-346 CK-348 CK-350	25.5 26.3 27.1 27.9 28.7	29.5 30.3 31.1 31.9 32.7	28.8 29.6 30.4 31.2 32.0	28.2 29.0 29.8 30.6 31.4	CK-12	12.7 (1/2)	238 (9.37)
CK-152 CK-154 CK-156 CK-158 CK-160 CK-162	CK-252 CK-254 CK-256 CK-258 CK-260 CK-262	CK-352 CK-354 CK-356 CK-358 CK-360 CK-362	29.5 30.3 31.1 31.9 32.6 33.4	34.1 34.9 35.7 36.5 37.2 38.0	33.3 34.1 34.9 35.7 36.5 37.3	32.6 33.4 34.2 35.0 35.7 36.5	CK-13	12.7 (1/2)	241 (9.49)
-	CK-264 CK-266 CK-268	CK-364 CK-366 CK-368	35.1 36.6 38.2	-	39.7 41.3 42.9	38.9 40.5 42.1	CK-14	19.0 (3/4)	273 (10.75)
-	CK-270 CK-272 CK-274	CK-370 CK-372 CK-374	40.7 43.9 47.0	-	46.1 49.2 52.4	45.3 48.4 51.6	CK-15	19.0 (3/4)	293 (11.54)
-	CK-276 CK-278 CK-280	CK-376 CK-378 CK-380	49.5 52.7 55.9	-	55.6 58.8 61.9	54.8 58.0 61.1	CK-16	19.0 (3/4)	312 (12.28)
-	CK-282 CK-284 CK-286	CK-382 CK-384 CK-386	58.2 61.4 64.6	-	65.1 68.3 71.5	64.3 67.5 70.7	CK-17	19.0 (3/4)	331 (13.03)
-	CK-288 CK-290 CK-292	CK-388 CK-390 CK-392	67.1 70.3 73.5	-	75.4 78.6 81.8	74.5 77.7 80.9	CK-18	25.4 (1)	375 (14.76)
-	CK-294 CK-296	CK-394 CK-396	76.6 79.8	-	84.9 88.1	84.0 87.3	CK-19	25.4 (1)	375 (14.76)
-	CK-298 CK-300	CK-398 CK-400	84.6 90.9	-	94.5 100.8	93.7 100.0	CK-20	25.4 (1)	413 (16.26)

HK TYPE TUBE EXPANDER



Tool No.			Expansion Range ØD				Mandrel		
Roller Reach ℓ			Min. mm	Max. Expansion			No.	Square S mm (in.)	Length L mm (in.)
38mm	57mm	76mm		38mm	57mm	76mm			
HK-101	-	-	9.2	10.9	-	-	HK-1	9.5 (3/8)	337 (13.27)
HK-103 HK-105	-	-	10.0 10.8	11.7 12.5	-	-	HK-2		
HK-107 HK-109 HK-111	HK-207 HK-209 HK-211	-	11.6 12.4 13.2	13.5 14.3 15.1	13.2 14.0 14.8	-	HK-4	9.5 (3/8)	340 (13.39)
HK-113 HK-115 HK-117	HK-213 HK-215 HK-217	HK-313 HK-315 HK-317	14.0 14.8 15.6	16.2 17.0 17.8	15.8 16.6 17.4	15.4 16.2 17.0	HK-6	9.5 (3/8)	340 (13.39)
HK-119 HK-121 HK-123	HK-219 HK-221 HK-223	HK-319 HK-321 HK-323	16.4 17.1 17.9	18.9 19.7 20.5	18.4 19.2 20.0	18.0 18.8 19.6	HK-8	9.5 (3/8)	342 (13.46)
HK-125 HK-127 HK-129 HK-131	HK-225 HK-227 HK-229 HK-231	HK-325 HK-327 HK-329 HK-331	18.7 19.5 20.3 21.1	21.5 22.3 23.1 23.9	21.1 21.9 22.6 23.4	20.6 21.4 22.1 22.9	HK-10	9.5 (3/8)	342 (13.46)
HK-132 HK-134 HK-136 HK-138 HK-140	HK-232 HK-234 HK-236 HK-238 HK-240	HK-332 HK-334 HK-336 HK-338 HK-340	21.5 22.3 23.1 23.9 24.7	25.0 25.8 26.5 27.3 28.1	24.4 25.2 26.0 26.8 27.6	23.8 24.6 25.4 26.2 27.0	HK-11	12.7 (1/2)	352 (13.86)
HK-142 HK-144 HK-146 HK-148 HK-150	HK-242 HK-244 HK-246 HK-248 HK-250	HK-342 HK-344 HK-346 HK-348 HK-350	25.5 26.3 27.1 27.9 28.7	29.5 30.3 31.1 31.9 32.7	28.8 29.6 30.4 31.2 32.0	28.2 29.0 29.8 30.6 31.4	HK-12	12.7 (1/2)	352 (13.86)
HK-152 HK-154 HK-156 HK-158 HK-160 HK-162	HK-252 HK-254 HK-256 HK-258 HK-260 HK-262	HK-352 HK-354 HK-356 HK-358 HK-360 HK-362	29.5 30.3 31.1 31.9 32.6 33.4	34.1 34.9 35.7 36.5 37.2 38.0	33.3 34.1 34.9 35.7 36.5 37.3	32.6 33.4 34.2 35.0 35.7 36.5	HK-13	12.7 (1/2)	355 (14.00)
-	HK-264 HK-266 HK-268	HK-364 HK-366 HK-368	35.1 36.6 38.2	- 41.3 42.9	39.7 40.5 42.1	38.9 40.5 42.1	HK-14	19.0 (3/4)	388 (15.28)
-	HK-270 HK-272 HK-274	HK-370 HK-372 HK-374	40.7 43.9 47.0	- 49.2 52.4	46.1 48.4 51.6	45.3 48.4 51.6	HK-15	19.0 (3/4)	408 (16.06)
-	HK-276 HK-278 HK-280	HK-376 HK-378 HK-380	49.5 52.7 55.9	- 58.8 61.9	55.6 58.0 61.1	54.8 58.0 61.1	HK-16	19.0 (3/4)	427 (16.81)
-	HK-282 HK-284 HK-286	HK-382 HK-384 HK-386	58.2 61.4 64.6	- 68.3 71.5	65.1 67.5 70.7	64.3 67.5 70.7	HK-17	19.0 (3/4)	446 (17.56)
-	HK-288 HK-290 HK-292	HK-388 HK-390 HK-392	67.1 70.3 73.5	- 78.6 81.8	75.4 77.7 80.9	74.5 77.7 80.9	HK-18	25.4 (1)	489 (19.25)
-	HK-294 HK-296	HK-394 HK-396	76.6 79.8	- 88.1	84.9 87.3	84.0 87.3	HK-19	25.4 (1)	489 (19.25)
-	HK-298 HK-300	HK-398 HK-400	84.6 90.9	- 100.8	94.5 100.0	93.7 100.0	HK-20	25.4 (1)	527 (20.75)

EFFECTIVE EXPANDING REACH

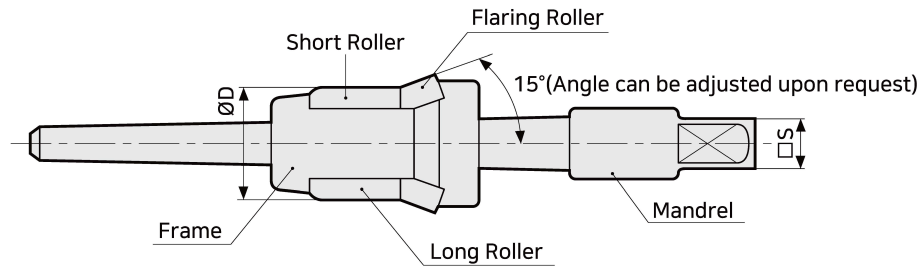
▼ CK TYPE ADJUSTABLE EFFECTIVE ROLLER REACH A

Tool No.	Roller Length B		Effective Roller Reach A(mm)	Tool No.	Roller Length B		Effective Roller Reach A(mm)	Tool No.	Roller Length B		Effective Roller Reach A(mm)
	Min. (mm)	Max. (mm)			Min. (mm)	Max. (mm)			Min. (mm)	Max. (mm)	
CK-101~105	15	44+@	30+@	-	-	-	-	-	-	-	-
CK-107~111	14	42+@	27+@	CK-207~211	33	61+@	46+@	-	-	-	-
CK-113~117	14	42+@	27+@	CK-213~217	33	61+@	46+@	CK-313~317	52	80+@	65+@
CK-119~123	12	41+@	24+@	CK-219~223	31	60+@	43+@	CK-319~323	50	79+@	62+@
CK-125~131	11	40+@	22+@	CK-225~231	30	59+@	41+@	CK-325~331	49	78+@	60+@
CK-132~140	11	38+@	19+@	CK-232~240	30	57+@	38+@	CK-332~340	49	76+@	57+@
CK-142~150	9	37+@	16+@	CK-242~250	28	56+@	35+@	CK-342~350	47	75+@	54+@
CK-152~162	8	36+@	14+@	CK-252~262	27	55+@	33+@	CK-352~362	46	74+@	52+@
-	-	-	-	CK-264~268	27	55+@	33+@	CK-364~368	46	74+@	52+@
-	-	-	-	CK-270~274	25	53+@	30+@	CK-370~374	44	73+@	49+@
-	-	-	-	CK-276~280	25	53+@	30+@	CK-376~380	44	73+@	49+@
-	-	-	-	CK-282~286	25	53+@	30+@	CK-382~386	44	73+@	49+@
-	-	-	-	CK-288~292	22	51+@	25+@	CK-388~392	41	70+@	44+@
-	-	-	-	CK-294~296	22	51+@	25+@	CK-394~396	41	70+@	44+@
-	-	-	-	CK-298~300	22	51+@	25+@	CK-398~400	41	70+@	44+@

▼ HK TYPE ADJUSTABLE REACH B AND EFFECTIVE ROLLER REACH A

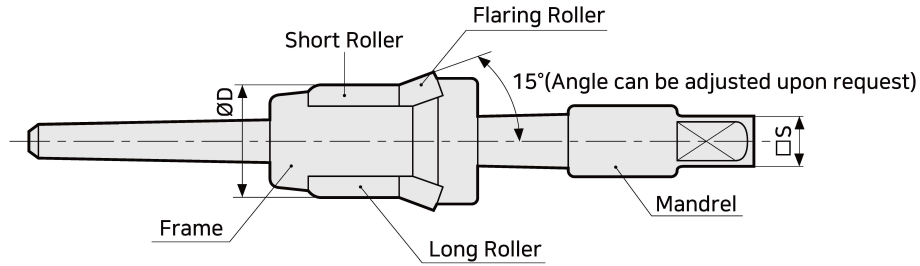
Tool No.	Roller Length B		Effective Roller Reach A(mm)	Tool No.	Roller Length B		Effective Roller Reach A(mm)	Tool No.	Roller Length B		Effective Roller Reach A(mm)
	Min. (mm)	Max. (mm)			Min. (mm)	Max. (mm)			Min. (mm)	Max. (mm)	
HK-101~105	15	147	30	-	-	-	-	-	-	-	-
HK-107~111	14	146	27	HK-207~211	33	165	46	-	-	-	-
HK-113~117	14	146	27	HK-213~217	33	165	46	HK-313~317	52	184	65
HK-119~123	12	144	24	HK-219~223	31	163	43	HK-319~323	50	182	62
HK-125~131	11	143	22	HK-225~231	30	162	41	HK-325~331	49	181	60
HK-132~140	11	141	19	HK-232~240	30	160	38	HK-332~340	49	179	57
HK-142~150	9	139	16	HK-242~250	28	158	35	HK-342~350	47	177	54
HK-152~162	8	138	14	HK-252~262	27	157	33	HK-325~362	46	176	52
-	-	-	-	HK-264~268	27	157	33	HK-364~368	46	176	52
-	-	-	-	HK-270~274	25	155	30	HK-370~374	44	174	49
-	-	-	-	HK-276~280	25	155	30	HK-376~380	44	174	49
-	-	-	-	HK-282~286	25	155	30	HK-382~386	44	174	49
-	-	-	-	HK-288~292	22	-	25	HK-388~392	41	-	44
-	-	-	-	HK-294~296	22	-	25	HK-394~396	41	-	44
-	-	-	-	HK-298~300	22	-	25	HK-398~400	41	-	44

BK TYPE TUBE EXPANDER



Roller Reach	19mm (3/4")	25.4mm (1")	32mm (1-1/4")	38mm (1-1/2")	44.5mm (1-3/4")	51mm (2")	57mm (2-1/4")	63.5mm (2-1/2")	70mm (2-3/4")	76mm (3")	83mm (3-1/4")	BK-47-10 Effective Roller Reach No. Tool No. Type	S brand Tool No.	Mandrel	
Roller Reach No.	0	1	2	3	4	5	6	7	8	9	10			Drum	Squares mm(in.)
Tool No.	Expansion Range ØD												S brand Tool No.	Mandrel	
	Min. mm	Max. Expansion(mm)												Drum	Squares mm(in.)
19	20.6	24.2	24.0	23.8	23.6	23.4							28	DK-0	12.7 (1/2)
20	21.4	25.2	25.0	24.8	24.6	24.4							29		
21	22.2	26.0	25.8	25.6	25.4	25.2	25.0						30		
22	23.0	26.8	26.6	26.4	26.2	26.0	25.8						31	DK-1	12.7 (1/2)
23	23.8	27.6	27.4	27.2	27.0	26.8	26.6	26.3					32		
24	24.6	28.4	28.2	28.0	27.8	27.6	27.4	27.1	26.9				33		
25	25.4	30.0	29.8	29.6	29.4	29.2	29.0	28.7	28.5				34		
26	26.2	30.8	30.6	30.4	30.2	30.0	29.8	29.5	29.3	29.1			35		
27	27.0	31.6	31.4	31.2	30.9	30.7	30.5	30.3	30.1	29.9			36	DK-2	12.7 (1/2)
28	27.8	32.4	32.2	32.0	31.7	31.5	31.3	31.1	30.9	30.7	30.4		37		
29	28.6	33.2	33.0	32.8	32.5	32.3	32.1	31.9	31.7	31.5	31.3		38		
30	29.4	34.6	34.4	34.2	33.9	33.7	33.5	33.3	33.1	32.9	32.7	32.5	39		
31	30.2	35.4	35.2	35.0	34.7	34.5	34.3	34.1	33.9	33.7	33.5	33.3	40		
32	31.0	36.2	36.0	35.8	35.5	35.3	35.1	34.9	34.7	34.5	34.3	34.1	41	DK-3	12.7 (1/2)
33	31.8	37.0	36.8	36.6	36.3	36.1	35.9	35.7	35.5	35.3	35.1	34.9	42		
34	32.5	37.7	37.5	37.3	37.1	36.9	36.7	36.5	36.3	36.0	35.8	35.6	43		
35	33.3	38.5	38.3	38.1	37.9	37.7	37.5	37.3	37.1	36.8	36.6	36.4	44		
36	34.1	40.1	39.9	39.7	39.5	39.3	39.1	38.9	38.7	38.4	38.2	38.0	45	DK-4	12.7 (1/2)
37	34.9	41.0	40.8	40.6	40.4	40.2	40.0	39.8	39.6	39.3	39.1	38.9	48	DK-10	19.0 (3/4)
38	36.5	42.6	42.4	42.2	42.0	41.8	41.6	41.4	41.1	40.9	40.7	40.5	49		
39	38.1	45.8	45.6	45.4	45.2	45.0	44.8	44.6	44.3	44.1	43.9	43.7	50		
40	39.7	47.4	47.2	47.0	46.8	46.6	46.4	46.2	45.9	45.7	45.5	45.3	51	DK-11	19.0 (3/4)
41	41.3	49.0	48.8	48.6	48.4	48.2	47.9	47.7	47.5	47.3	47.1	46.9	52		
42	42.9	50.6	50.4	50.2	50.0	49.8	49.5	49.3	49.1	48.9	48.7	48.5	53		
43	44.5	52.2	52.0	51.8	51.6	51.4	51.1	50.9	50.7	50.5	50.3	50.1	54		
44	46.0	53.8	53.6	53.4	53.1	52.9	52.7	52.5	52.3	52.1	51.9	51.7	55	DK-12	19.0 (3/4)
45	47.6	55.3	55.1	54.9	54.7	54.5	54.3	54.1	53.9	53.7	53.5	53.2	56		
46	49.2	56.9	56.7	56.5	56.3	56.1	55.9	55.7	55.5	55.3	55.1	54.8	57		

BK TYPE TUBE EXPANDER



Roller Reach	19mm (3/4")	25.4mm (1")	32mm (1-1/4")	38mm (1-1/2")	44.5mm (1-3/4")	51mm (2")	57mm (2-1/4")	63.5mm (2-1/2")	70mm (2-3/4")	76mm (3")	83mm (3-1/4")	BK-47-10			
Roller Reach No.	0	1	2	3	4	5	6	7	8	9	10	Type	Effective Roller Reach No.	Tool No.	
Tool No.	Expansion Range ØD														S brand Tool No.
	Min. mm	Max. Expansion(mm)											Drum	Squares mm(in.)	
47	50.8	58.5	58.3	58.1	57.9	57.7	57.5	57.3	57.1	56.8	56.6	56.4			58
48	52.4	60.1	59.9	59.7	59.5	59.3	59.1	58.9	58.6	58.4	58.2	58.0	59	DK-13	19.0 (3/4)
49	54.0	61.7	61.5	61.3	61.1	60.9	60.6	60.4	60.2	60.0	59.8	59.6	60		
50	55.6	63.3	63.1	62.9	62.7	62.5	62.2	62.0	61.8	61.6	61.4	61.2	61		
51	57.2		66.0	65.8	65.5	65.3	65.1	64.8	64.6	64.4	64.1	63.9	62	DK-14	19.0 (3/4)
52	58.7		67.6	67.4	67.1	66.9	66.7	66.4	66.2	65.9	65.7	65.5	63		
53	60.3		69.2	69.0	68.7	68.5	68.3	68.0	67.8	67.5	67.3	67.1	64		
54	61.9		70.8	70.5	70.3	70.1	69.8	69.6	69.4	69.1	68.9	68.7	65		
55	63.5		72.3	72.1	71.9	71.6	71.4	71.2	70.9	70.7	70.5	70.2	66		
56	65.1		73.9	73.7	73.5	73.2	73.0	72.8	72.5	72.3	72.0	71.8	67	DK-15	19.0 (3/4)
57	66.7		75.5	75.3	75.0	74.8	74.6	74.3	74.1	73.9	73.6	73.4	68	DK-16	25.4 (1)
58	68.3		77.1	76.9	76.6	76.4	76.2	75.9	75.7	75.5	75.2	75.0	69		
59	69.9		78.7	78.5	78.2	78.0	77.8	77.5	77.3	77.0	76.8	76.6	70		
60	71.4		80.3	80.1	79.8	79.6	79.4	79.1	78.9	78.6	78.4	78.2	71		
61	73.0		81.9	81.6	81.4	81.2	80.9	80.7	80.5	80.2	80.0	79.8	72		
62	74.6		83.5	83.2	83.0	82.8	82.5	82.3	82.1	81.8	81.6	81.4	73	DK-17	25.4 (1)
63	76.2		86.3	86.1	85.8	85.5	85.3	85.0	84.7	84.5	84.2	84.0	74	DK-18	25.4 (1)
64	77.8		87.9	87.6	87.4	87.1	86.9	86.6	86.3	86.1	85.8	85.5	75		
65	79.4		89.5	89.2	89.0	88.7	88.5	88.2	87.9	87.7	87.4	87.1	76		
66	81.0		91.0	90.8	90.6	90.3	90.0	89.8	89.5	89.2	89.0	88.7	77		
67	82.6		92.7	92.4	92.1	91.9	91.6	91.4	91.1	90.8	90.6	90.3	78		
68	84.1		94.3	94.0	93.7	93.5	93.2	92.2	92.7	92.4	82.1	91.9	79	DK-19	25.4 (1)
69	85.7		95.9	95.6	95.3	95.1	94.8	94.5	94.3	94.0	93.7	93.5	80	DK-20	25.4 (1)
70	87.3		97.4	97.2	96.9	96.6	96.4	96.1	95.8	95.6	95.3	95.1	81		
71	88.9		99.0	98.8	98.5	98.2	98.0	97.7	97.4	97.2	96.9	96.7	82		
72	90.5		100.6	100.3	100.1	99.8	99.6	99.3	99.0	98.8	98.5	98.2	83		
73	92.1		102.2	101.9	101.7	101.4	101.2	100.9	100.6	100.4	100.0	99.8	84		
74	93.7		103.8	103.5	103.3	103.0	102.7	102.5	102.0	101.9	101.7	101.4		DK-21	25.4 (1)
75	95.3		105.4	105.1	104.9	104.6	104.3	104.1	103.8	103.5	103.3	103.0	DK-22	25.4 (1)	
76	96.8		107.0	106.7	106.4	106.2	105.9	105.7	105.4	105.1	104.9	104.6			
77	98.4		108.0	108.3	108.0	107.8	107.5	107.3	107.0	106.7	106.5	106.2			
78	100.0		110.2	109.9	109.6	109.4	109.1	108.8	108.6	108.3	108.0	107.8			
79	101.6		111.7	111.5	111.2	110.9	110.7	110.4	110.1	109.9	109.6	109.4			
80	103.2		113.3	113.1	112.8	112.5	112.3	112.0	111.8	111.5	111.2	110.0		DK-23	25.4 (1)
81	104.8		114.9	114.7	114.4	114.1	113.9	113.6	113.4	113.1	112.8	112.6		DK-24	25.4 (1)

Note : Special orders are available for specifications not listed above.